

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The Mining Journal is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2285.—Vol. XLIX.

LONDON, SATURDAY, JUNE 7. 1879.

WITH SUPPLEMENT. PRICE SIXPENCE PER ANNUM, BY POST, £1 1s.

**MR. JAMES H. CROFTS, STOCK AND SHARE BROKER AND MINING SHARE DEALER,**  
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.  
ESTABLISHED 1842.

BUSINESS transacted in all descriptions of Mining Stocks and Shares (British and Foreign), Consols, Banks, Bonds (Foreign and Colonial), Railways, Insurance, Assurance, Telegraph, Tramway, Shipping, Canal, Gas, Water, and Dock Shares, and all Miscellaneous Shares.

BUSINESS negotiated in Stocks and Shares not having a general market value.

Every Friday a general and reliable List issued (a copy of which will be forwarded regularly on application), containing closing prices of the week.

MINES INSPECTED.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUSTELL.

SPECIAL DEALINGS in the following, or part:—

50 Chapel House, £1 7s 6d	50 Javali, 6s. 6d.	5 Santa Barbara, £2 3/4
25 Colorado, £1 15s.	25 Leadville, £2 3/4	20 St. Harmon.
10 East Van, £1 15s.	10 Llanrwst, 10s.	10 Tanberville, £2 3/4
20 Eberhardt, £2 3/4	20 Morla Du, 17s.	20 Van Consols and Glyn
50 Frontino, £2 5s.	100 Penstruthal, 2s.	Amalgamated.
30 Glenroy, 9s.	100 Penstruthal, 3s. 6d.	25 W. Assheton, 18s. 9d.
10 St. Lacey, £1 15s.	25 Parys Corporation, 10s.	20 West Chiverton, £2 3/4
20 Herodfoot, £2 3/4	10 Richmond, £2.	(call paid).
10 Hultafall, £2.	50 Rookhope, 4s.	10 Wye Valley.

\* \* \* SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS ON DEPOSIT OF TWENTY PER CENT.)

RAILWAYS—SPECIAL BUSINESS.

FOREIGN BONDS—SPECIAL BUSINESS.

Fortnightly accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE LONDON.

ESTABLISHED 1842.

**MR. W. H. BUMPUS, STOCK AND SHARE BROKER, AND MINING SHARE DEALER,**  
44, THREADNEEDLE STREET, LONDON, E.C.  
ESTABLISHED 1867.

BUSINESS transacted in STOCK EXCHANGE SECURITIES and MISCELLANEOUS SHARES of every description.

RAILWAYS, BANKS, FOREIGN AND COLONIAL BONDS, TRAMWAYS, TELEGRAPHS, and all the LEADING INVESTMENTS.

Accounts opened for the Fortnightly Settlement.

A Stock and Share List free on application.

Mr. BUMPUS has SPECIAL BUSINESS in the undermentioned:—

50 Almada, 6s. 6d.	10 East Pool, £2 3/4	15 Mellanear, £2 3/4
10 Aberllyn.	20 Eberhardt, £2 3/4	25 New Quebrada, 43s.
40 Birdseye, 11s. 6d.	40 Frongoch, £2 3/4	100 Nouveau Monde.
25 Blue Kent, £2 3/4	25 Frontino, 44s.	60 Parys Corp., 9s.
50 Bettw-y-Cood, 18s.	30 Great Holway.	50 Port Phillip, 9s. 6d.
70 Bodidra.	5 Great Lacey, £1 15s.	60 Penstruthal, 2s. 7d.
3 Carn Brea, £2 2 1/2	50 Javali, 6s.	20 Richmond, £7 18s. 9d.
50 Colorado, 34s.	20 Herodfoot, £2 3/4	10 Roman Grav., £2 3/4
25 Chapel House.	40 Hultafall, £2 3/4	15 So. Frances, £8 18s. 9d.
250 Chontales.	150 I.X.L.	25 Santa Barbara, 41s. 6d.
5 Cape Copper, £27 1/2	50 Javali, 6s. 6d.	5 So. Condurrow, £12.
50 Casuda Gold.	75 Kapanga, 4s. 6d.	10 Tankerville, £2 3/4
2 Dolcoath, £2 3/4	20 Leadville, 41s.	5 Van, £17 s.
100 Don Pedro, 20s.	25 Lead Era.	20 Wheel Peavor, £2 3/4
20 Deron Consols, 35s.	50 Morla Du, 18s.	10 Wheel Grenville, £4 3/4
15 D'Ereby Consols.	50 Marke Valley, 12s. 6d.	40 West Assheton.
30 East Van, 34s.	5 Minera.	

MINES.—Many good purchases may now be made, especially in Tin and Lead Shares, some of which (now returning good dividends) are likely to have a considerable rise, besides paying exceedingly well as an investment. Shares in several SOUTH AFRICAN MINES may also be secured now on favourable terms, and will probably double their present value within the next few months.

A carefully selected List on application.

SPECIAL BUSINESS, at close prices, in the SHARES of all the principal HOME and FOREIGN MINES.

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STOCK AND SHARE DEALERS.

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Cwm Brynno.	Pant-y-Mwyn.	Tyn-y-Fron.

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40 Bodidra.	20 Frongoch, £2 1s. 3d.	50 Penstruthal, 1s. 9d.
40 Bluen Caelan, £2 3/4	35 Gorseid, £2 3s. 9d.	25 Plympton Mining and
5 Cape Copper, £2 3/4	15 Grosgrain, £2 3/4	Arsenic, 10s.
50 Colorado, £1 15s.	25 Herodfoot, £2 15s.	10 Rhydalun, £2 10s.
20 Cakemore, £2 3/4	75 Javali, 6s. 6d.	10 Richmond, £2 10s.
50 Cwm Brynno, £2 3/4	20 Leadville, £2.	20 Rookhope, 4s.
75 Chontales, 3s. 6d.	50 Last Chance, 8s. 3d.	10 Roman Grav., £2 13s. 9d.
50 Devon Cons., £2.	20 Lead Era.	200 Rossa Grande, 2s.
50 Don Pedro, 20s. 6d.	20 Monydd Gorddu, 40s.	25 Talychon, 14s.
20 East Van, £1 s.	20 Morla Du, 17s.	15 Tankerville, £2 3/4
20 Eberhardt, £2 10s.	20 New Quebrada, £2 3/4	50 Tamar Sil.-Lead, £1 1/4
50 Exchequer, 4s. 6d.	5 Pandora, 7s. 8d.	5 Van, £17 10s.
50 Flagstaff, 6s.	100 Port Phillip, 9s. 6d.	20 W. Wh. Peavor, £2 5s.

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Leoman Bank.	Chontales.	Panicillo.
Parys Mountain.	Don Pedro.	Port Phillip.
Roman Gravels.	Eberhardt.	Richmond.
South Frances.	Frontino.	

BANKERS: LONDON AND WESTMINSTER.

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FORTNIGHTLY ACCOUNTS opened, on receipt of the usual "cover," in Railways Home and Foreign, Mining Shares, Foreign Bonds, and certain Miscellaneous Securities.

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Gawton, 5s.	Morla Du, 18s. 6d.	West Peavor, £2 5s.
Herodfoot, £2 12s. 6d.	Roman Gravels, £2 3/4	Wheal Crebor, 6s. 3d.
Hultafall, £1 17s. 6d.	South Frances, £9.	Wheal Uny, 7s.
Leadville, £2.	Tankerville, £3 12s. 6d.	Wheal Peavor, £2 18s. 9d.
	West Chiverton, £2 3/4	

NOTICE OF REMOVAL.

**MR. JOHN B. REYNOLDS, STOCK AND SHARE DEALER,**

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5 D'Ereby Mountain.	20 Hornaches.	50 Temple.
25 Clementina.	50 Lead Era.	100 Tyn-y-Fron, 7s. 6d. pd.
3 West Chiverton.	20 Monydd Gorddu.	100 Bettw-y-Cood.
	50 Hultafall.	

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**NATIONAL PROVINCIAL BANK OF ENGLAND,**

BISHOPSGATE STREET (corner of Threadneedle-street),

LONDON, E.C., JUNE 3, 1879

The Directors of the National Provincial Bank of England hereby give notice

that a HALF YEARLY DIVIDEND at the rate of EIGHT PER CENT. PER

ANNUM, and a HALF YEARLY BONUS OF SEVEN PER CENT., will be

PAYABLE on the Bank's Stock on and after the 7th day of July next, when the

Dividend and Bonus Warrants may be obtained at the Bank, No. 112, Bishopsgate-

street (corner of Threadneedle street), or at the different Branches.

The Transfer Books will be closed on and after Saturday, the 7th instant, until the

Dividend and Bonus become payable.

By order of the Court of Directors,

WILLIAM BOLT, } Joint

R. FERGUSON, } General

T. G. ROBINSON, } Managers.

**THE CAPE COPPER MINING COMPANY**

(LIMITED).

Notice is hereby given, that at a Meeting of the Directors of this company, held

to day, it was resolved:—

"That a DIVIDEND of TWELVE SHILLINGS AND SIXPENCE PER

SHARE, free of income tax, be and is hereby DECLARED, PAYABLE on the



## Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES.—No. CXVIII\*

BY J. CLARK JEFFERSON, A.B.S.M., WH. 8C.,

Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal).  
[The Author reserves the right of reproduction.]

## SECTION VI.

## THE OPENING OUT AND WORKING OF MINES.

In most English works the term winning and working of mines is that generally employed to denote the subject of which the present section treats. The term winning, however, includes that of shaft sinking, which has already been treated of in the last section. The German term "Ausrichtung" denotes rather the preliminary operations for the methodical working out of the mineral after the deposit has been reached by the shaft, and corresponds, therefore, best with the term "opening out" for the subsequent working. In many cases, in fact in most cases, the two operations, opening out and working, are carried on simultaneously; or, more strictly speaking, the opening out for a fresh portion of the workings is carried on simultaneously with the working out of a portion already opened out.

Before proceeding to discuss the working away of a deposit it becomes necessary to have a pretty correct definition of the term mine. After the French revolution, when the republic claimed the possession of all minerals as the common property of the country at large, the French mining law distinguished three descriptions of works which come under the general terms of mines, diggings, and quarries. The two latter may be distinguished as open workings, and as their modes of working present great analogy, we have in considering the subject of this section to divide all deposits into—

**MINES, AND SURFACE OR OPEN WORKINGS.**—The distinguishing characteristic of mines may be said to be the underground nature of the workings, whilst that of surface workings is that the workings are carried on in the open. As the laws of open workings are distinct from those of underground mining, and in many cases it may be advantageous to the workers to have the workings classed as open work, whilst the owners wish to obtain royalties on the deposit as a mine, the distinction may sometimes be of pecuniary importance. It has often been ruled that workings which are carried on by daylight are not mines, but open works, and that where artificial lights have to be used the workings must be classed as mines. As can be well imagined, there is no hard and fast line of demarcation between the two. The minerals most frequently worked by open workings are building stones, limestones for burning, slates for roofing, rock salt, gypsum, lignite, peat, ironstones, china clay, and alluvial deposits of tin and gold. Open works are also frequently employed in the early operations upon deposits which have ultimately to be worked underground, such as coal seams, and other bedded deposits near their outcrop, the back or outcrop of lode, and irregular seams. Stone is not only quarried in the open but often worked underground, as at Bradford, Yorkshire, the Muhlstein quarries, between Mayence and Andernach. Many minerals which are usually worked underground sometimes require getting in open works, as the brown coal deposits in Saxony, the lead ore deposits of Komern in Rheinisch Prussia.

After a deposit has been reached, either by means of a level or a shaft, there are many preliminary arrangements to the methodical working away of the coal, which we have called the "opening out of the mine." This generally consists in the driving of levels or inclined roads or galleries, and even of shafts in the deposit, so as to cut up the latter into portions suitable for working. The reaching of the deposit by means of shafts has already been noticed; it will be advisable, if not necessary, for us to consider first the reaching of a deposit by means of a level before considering the preliminary work to the working away of the deposit.

The roadway driven to obtain access to a deposit is usually called the adit or adit level (German—"Stolln"). The English term adit, however, includes any passage from a hillside into a mine for access or drainage, or both. In the North of England the drainage adits are called soughs, and the proprietors sough companies. The German "stolln" may serve numerous purposes—(1, and principally) to afford access to the mine and for general conveyance purposes both in the pit and for bringing the minerals to the surface; (2) for draining the mine, the water from workings above being caught, and led to some part of the level, and the water from the workings below being raised by pumping machinery, and discharged into the stolln, thus diminishing the height to which the water must be raised; (3) as ventilating drifts for carrying fresh air into the workings, and often as a reservoir for supplying water-power to the water-wheels, &c., used for actuating the pumping and other machinery, or even as a canal to serve the purpose of navigation in the mine itself. There are often several stollns in connection with the same mine. The uppermost is sometimes called the exploratory (Schürf) stolln drift when it has been first driven for the purpose of exploring the deposit. When the deposit is in a mountainous district a second or third stolln may be driven from the hillside to obtain access to the deposit, when the deposit has been already worked out down to the level of the stolln next above, as the expense of pumping the water and raising the mineral is thus avoided. All these stollns are sometimes called the upper stollns, in contradistinction to others driven below the level of the bottom of the valleys, when the deposit has been worked out down to this level; these latter may be called underground levels.

The English term adit is restricted to passages coming to the surface, which is not the case with the German word stolln. The most comprehensive English term is drift; this differs from stolln in meaning any principal passage in the mine or country rock irrespective whether it terminates at the surface or not. A similar idea attaches to the French term "galerie," when it is desired to distinguish specially, the purpose of the drift is usually specified, as galerie d'exploitation (exploring drift). Similarly the purpose for which a stolln is driven is often specified as wetter stolln (ventilating drift), wasser stolln (drainage drift), and hilfstolln (auxiliary drift).

The place where the stolln or adit comes to the surface is called the mouth of the adit, the opposite end of the adit is called the face or forebreast of the adit. The channel cut from the mouth of the adit to the nearest stream to carry away the water is called the low slough. The upper part of the adit is called the roof, the bottom the sole, the lower portion of the adit up to the surface of the water running through it is called the water channel. The water generally runs in the lower part of the adit only, the adit being built so high that there is room above the surface of the water for a person to walk upright. For the purposes of travelling a pathway is generally formed of planks resting on cross bearers placed above the water level, which has already been described in the last section. The timber is denominated stepping or travelling work, and the space above as travelling room.

Of some importance is the position chosen for the mouth of the adit. The lower down in the valley so much the greater is the amount of the deposit which can be drained by the single adit, and consequently the expense spread over a greater amount of mineral. The adit may be driven either in the deposit and consequently the mouth of the adit situated in the outcrop of the lode, or the adit might be driven through the country rock at right angles to the strike of the deposit. Both as regards the depth at which the adit is driven below the last one, and whether the adit is driven in the deposit or country rock, the locality of the principal ore-bearing portions or workings of the lode, and the contour of the surface, are of importance. If the mouth of the adit be started low, and the adit carried through the country rock, a greater time must elapse before the connection between the adit and the workings can be effected;

this may be very disadvantageous to the economical working of the mineral. From this it will be seen that a careful discussion of the future and present necessities of the mine is required before deciding upon the position for the mouth of the adit. Where the mouth of the adit is situated in valleys or in the neighbourhood of streams it should be placed at least 6 feet above the highest known water level. If the adit is to form the chief road for conveying the minerals out of the mine the necessities of surface transport, and of dressing-floors in the case of metalliferous mines, and of screens, &c., in the case of coal mines, are all points of weight in deciding on the position for the mouth of the adit.

Generally speaking the adit is driven at right angles to the strike of the deposit until the deposit is reached, when the adit is continued in the deposit itself. This is more especially the case where there are several lodes running parallel. The adit is driven at right angles to the general strike of the lodes, and a wing (or flank) adit in each of the lodes conveys the water from the workings in each lode to the main adit. Often one adit driven in one of the lodes is made to drain the workings in the neighbouring lodes. The direction of the strike of a deposit, as mentioned in the first section, varies when the deposit is irregular in shape; in such a case the general direction of the strike is followed by the adit. In driving one of the main adits in the Mansfield copper-slate mines, the general direction of the strike was followed. It was found, however, that the country rock was so hard that it would have been much cheaper to have followed the sinuous course of the special strike.

As examples, the principal adits of the Hartz were cited. One of the first adits, the so-called 13 fm. adit, was driven as early as the year 1524, the Magdeburg adit four years later. The 19 fm. adit in 1551. The deep George adit (called after King George III. of England and Hanover) was commenced in 1777 and completed in 1799: this adit is 12 to 13 English miles long, coming to the surface at Grond. The deepest adit in the Hartz (which comes to the surface at Gittelde) is the Ernest August adit, 60 fms. below the George adit, and is 10 ft. by 6 ft., and upwards of 18 miles long. This adit was 12 years in driving, and was commenced in ten different places, nine auxiliary shafts being sunk for the purpose. The deepest drainage adit (which does not come to the surface) is 120 fms. below the Ernest August adit. As other examples of long adits may be mentioned the Emperor Joseph adit, at Schannitz, in Hungary; the County adit, near Falmouth, Cornwall, which is 30 to 40 miles long; the 70 fm. level at Allenheads, 6 miles in length.

## THE IRON INDUSTRIES OF SCOTLAND.

By RICHARD MEADE, Assistant Keeper of Mining Records,  
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**FIG-IRON MANUFACTURE.**—The earliest information bearing on iron smelting in Scotland dates about the year 1750, in which year the first furnace was erected at Bunawe, in Argylshire, by a Mr. Ford; in this furnace the blast was impelled by water power obtained from the River Awe, the ore employed being brought from Ulverstone, in Lancashire, while for fuel, charcoal alone was employed, with the aid of cold blast. The iron thus manufactured enjoyed then, as now, a high reputation, and for purposes of conversion into crucible steel is quite as reliable as the best Swedish or Russian brands. The Bunawe furnace, now known as the Lorne, is still in operation, the proprietors being Messrs. Harrison, Ainslie, and Co., who continue to make charcoal pig-iron from time to time according to the supply of charcoal obtainable. The above-named firm also possess works in Lancashire at Newland and Backbarrow, in Cumberland at Duddon, and in Hampshire at Warsash, at each of which works there is one furnace. Previous to the year 1788 there appears to have been a similar furnace erected at Goatfield, also in Argylshire, and it is recorded that the yield of the Bunawe and Goatfield furnaces amounted to 1400 tons, or 700 tons per furnace.

Hitherto attention has been directed to the early furnaces erected at Bunawe and Goatfield, in which charcoal pig-iron was manufactured. We will now follow the production of coke or coal pig-iron, dating with the year 1760, when the first blast furnace was put in operation at the Carron Ironworks, in Stirlingshire, where for some time charcoal was employed. Very soon, however, the powerful blowing machinery, invented by Smeaton in the same year, was successfully applied, and was the most complete of its kind then in use. The blowing machinery referred to consisted of four cylinders 4 ft. 6 in. in diameter, exactly fitted with pistons, and so contrived that the strokes of the pistons being made alternately produced an almost uninterrupted blast. The pumps were worked alternately by means of a powerful water-wheel, which had four cranks upon its axis, each of which moved the piston of a cylinder through its stroke of 4 ft. 6 in. The great advantages secured by Smeaton's invention enabled the ironmasters to consume the hard dense coke in the furnace, which the ordinary bellows previously in use was unable to effect; an increased yield of the furnace was the result; hitherto it was from 10 to 12 tons per week, now it rose to 40 tons in the same period, and on the average 1500 tons of pig-iron were made per annum.

The name of Dr. John Roebuck is intimately associated with the Carron Ironworks; he was a man of considerable scientific attainments, and devoted his energy most thoroughly towards the development of the iron industries of Scotland; he was the principal proprietor in the Carron Company, the works of which soon became the most famous in Europe. The site of Carron was selected on account of the abundant water supply and the immense deposits of ironstone, coal, and limestone in the immediate vicinity of the village. It was in the immediate neighbourhood of Carron that James Watt, in association with Dr. Roebuck, erected his first steam-engine, the patent for which was secured in the year 1769, and in that year, too, the first carronade, the invention of General Melville, was cast at Carron Foundry, from which, indeed, the new form of cannon derived its name. The manufacture of carronades was long the speciality of the Carron Ironworks, and it was in a great measure owing to the extraordinary extent of this branch of industry during the wars that the proprietors of the works made such fabulous profits.

The earliest authentic record bearing on the production of pig-iron in England and Wales was for the year 1740, and some 10 years before the introduction of the manufacture into Scotland; at that period 59 furnaces were in operation, producing 17,350 tons of pig-iron, the fuel employed being coke, except in the Kent and Sussex furnaces, where there is every reason to infer that charcoal was still employed. The details of furnaces and make of pig-iron appear as follows:—

Counties.	Number of furnaces.	Pig-iron—tons.
Breconshire.....	2	600
Cheshire.....	3	1,700
Carmarthenshire.....	1	100
Derbyshire.....	2	550
Glamorganshire.....	2	400
Gloucestershire.....	4	800
Hampshire.....	3	1,350
Herefordshire.....	6	2,850
Kent.....	1	200
Monmouthshire.....	2	900
Montgomeryshire.....	4	400
Nottinghamshire.....	1	200
Shropshire.....	6	2,100
Staffordshire.....	2	1,000
Sussex.....	10	1,400
Warwickshire.....	2	700
Worcestershire.....	2	700
Yorkshire.....	6	1,400
Total.....	59	17,350

In William Aiton's General View of the Agriculture of the County of Ayr, published in 1811, we learn some interesting facts bearing on the iron industries of Scotland, from which it appears that the manufacture of iron was carried on for some time by Lord Cathcart and others at Muirkirk, in the early part of the previous century. It was made from ore dug there, and sent to Bunawe, in the county of Argyle, to be reduced into pig-iron, which was afterwards brought to Muirkirk, where it was made into bar-iron. In the last opera-

tion charred peat was used, the art of coking coals not being then known. These operations were found, however, to be too expensive, and the work was abandoned. It is further stated by Aiton that in the year 1787 some gentlemen in Glasgow entered into a partnership, and erected some very extensive ironworks in that parish, which were still carried on in Aiton's time by another company. The works at that time consisted of three large blast-furnaces for making pig-iron, an extensive forge for making bar-iron, with a foundry and other accessory works, the number of hands employed in the above works at that time amounting to from 300 to 400; while the mineral field of the Muirkirk Company at the time referred to exceeded 2000 acres of coal and ironstone.

Sir John Sinclair, writing in 1792, said that the Carron Ironworks, previously referred to, consisted of five blast-furnaces, sixteen air-furnaces, a clay-mill for grinding clay to make bricks for the said furnaces, an engine raising  $4\frac{1}{2}$  tons of water at each stroke, and on an average making seven strokes in a minute (equal to  $31\frac{1}{2}$  tons per minute), its consumption of coal being 16 tons in 24 hours. There were three cupola furnaces; four boring mills, for boring guns, pipes cylinders, &c.; smiths' forges for making large anchors and anvils, as well as small work of various kinds, a forge for making malleable iron, a plating forge, and a forge for stamping iron, the hammer and helve of which were both of cast metal, and weighed  $1\frac{1}{2}$  ton. Carron acquired its reputation for the pig-iron made at the works, and for the extent, variety, and excellency of its foundry products; it preceded all other ironworks in Scotland in the manufacture of malleable iron.

Succeeding the Carron Works, the next important seat of iron manufacture in Scotland sprang up at Wilsonstown, or Cleugh, in the Upper Ward of Lanarkshire, near the boundary of Midlothian. It was here, about the year 1774, that the brothers Wilson, merchants, engaged in the Swedish iron trade, commenced to develop the coal deposits of the district, and soon afterwards established a foundry. This was succeeded in the year 1780-81, when the works were further extended, the Messrs. Wilson putting their first blast furnace in operation; and some years later, in 1787, blowing in a second furnace. An extensive forge was subsequently added to the already extensive works, and when in the year 1798 Mr. John Wilson became the sole proprietor, the forge was increased, and in the year 1804 a rolling mill was erected.

With this brief sketch of the rise and progress of the iron industries of Scotland previous to the year 1788, for many of the facts contained therein we are indebted to Mr. John Mayer's, F.C.S., of Glasgow, instructive paper on the Iron Manufacture of Scotland, read before the Glasgow meeting of the Iron and Steel Institute in the year 1872; it will be desirable to note the early returns of the iron trade in both England and Scotland, distinguishing the coke pig-iron from that prepared with charcoal. The following statement shows the production of each variety in the year 1788:—

Districts.	Furnaces.	Tons.	Furnaces.	Tons.
ENGLAND.				
Cheshire.....	1	300	1	600
Cumberland.....	1	300	1	700
Derbyshire.....	1	300	7	4,200
Gloucestershire.....	4	2,600	—	—
Lancashire.....	3	2,100	—	—
Monmouthshire.....	3	2,100	—	—
Shropshire.....	3	1,800	21	23,100
Staffordshire, North.....	—	—	6	4,500
Staffordshire, South.....	—	—	3	2,400
Sussex.....	2	300	—	—
Westmoreland.....	1	400	—	—
Yorkshire.....	1	600	6	4,500
Total.....	19	10,500	45	40,000

WALE.				
Brecknockshire.....	—	—	2	1,600
Carmarthenshire.....	1	400	—	—
Glamorganshire.....	3	1,800	6	6,600
Merionethshire.....	1	400	—	—
Total.....	5	2,600	8	8,200

SCOTLAND.				
Bunawe.....	1	700	—	—
Goatfield.....	1	700	—	—
Carron.....	—	—	4	4,000
Wilsonstown.....	—	—	2	1,600
Total.....	2	1,400	6	5,600

These returns show the aggregate production of pig-iron in Great Britain in the year 1788 as 68,300 tons, of which 14,500 tons were charcoal and 53,800 tons coke pig-iron, and of which Scotland contributed 10 per cent.; the average yield of her blast furnaces at this period being 875 tons compared with 793 tons the yield of the English and Welsh furnaces.

The ironworks at Muirkirk, in Ayrshire, as previously stated, and those at Omoa, in Lanarkshire, were commenced in the year 1787; the last named works were dismantled a few years since. The former still exists, and the iron there manufactured has a high reputation; it is stated that very early in its history it became famous for its bar-iron, which was little if at all inferior to Swedish iron. In the year 1796 there were two blast furnaces at these works, in which year 2878 tons of pig-iron were made. In the year 1788 the Muirkirk and Omoa Works commenced operations, and in the same year the Clyde Ironworks, near Glasgow, were projected by the Messrs. Edington and Co. These latter works have been rendered famous by being associated with two names, celebrated in the metallurgical industries of Great Britain—the one Mr. David Mushet, the other Mr. James Beaumont Neilson. The first named entered these works as accountant in the year 1792, when he was 19 years of age, and remained till the year 1800. In the following year, while engaged in the projection of the Calder Ironworks, in association with Mr. William Dixon, sen., of Govan, Mushet made the discovery of the blackband ironstone which in subsequent years exercised such an important effect in promoting the prosperity of Scotland in her metallurgical and associated industries.

Since the year 1788, when the pig-iron production of Scotland was 7000 tons, of which 1400 tons were charcoal iron and 5600 tons coke pig-iron, we do not find any returns available until near the close of the year 1800, when the then condition of the coal trade called forth an enquiry which was made by a Committee of the House of Commons, presided over by Mr. William Manning, M.P. The interest of the iron trade at this period was represented by Dr. H. G. Macnab, who prepared on the part of that important body a statement showing the production of pig-iron in Great Britain in the year 1796, of which the following abstract shows the production of pig-iron (coke and charcoal), the number of furnaces in operation being 124, the production of pig-iron 125,079 tons. Side by side will be found the quantities returned by the Excise authorities, amounting to 167,311 tons, which it was subsequently ascertained was in excess of the actual production of the furnaces at that time:—

Districts.	No. of furnaces.	Actual returns. Pig-iron—tons.	Excise returns. Pig-iron—tons.
North Staffordshire.....	2	1,958	4,700
Cumberland.....	2	565	3,744
Derbyshire.....	12	9,656	10,200
Gloucestershire.....	2	380	380
Herefordshire.....	4	1,749	2,070
Lancashire.....	3	2,249	2,180
Shropshire.....	23	32,989	68,129
Yorkshire, West Riding.....	13	10,398	13,922
Sussex.....	1	173	173
South Wales.....	24	34,101	38,508
Mid Wales.....	1	150	200
North Wales.....	5	1,144	6,230
West Wales.....	1	290	1,056
South Staffordshire.....	14	13,211	15,820
Scotland (coke).....	15	15,186	—
Ditto (charcoal).....	2	900	—
Total.....	124	125,079	—

These figures show an average yield of pig-iron slightly in excess

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergstrath Dr. VON GROEDER, Director of the Royal Bergakademie, Clausthal, The Hartz, North Germany.



of 1000 tons per furnace. The production of Scotland was 16,086 tons, bearing the proportion of nearly 8 per cent. to the total make of the kingdom.

The return prepared by Dr. Macnab, to which previous reference has been made, gives the following details of the furnaces in operation in Scotland in the year 1796, and the quantities of pig-iron made at each establishment:—

Name of works.	No. of furnaces.	Make of pig-iron—tons.	Average per furnace—tons.
Carron .....	4 .....	5,616 .....	1404 .....
Wilstontown .....	2 .....	2,080 .....	1040 .....
Muirkirk .....	2 .....	2,878 .....	1439 .....
Clyde .....	3 .....	2,216 .....	738 .....
Omoa .....	2 .....	1,198 .....	599 .....
Devon .....	2 .....	1,198 .....	599 .....
Goatfield (charcoal) ..	1 .....	300 .....	300 .....
Bonawe do .....	1 .....	600 .....	600 .....

Total .....

Of the total production of Scotland in the year 1796 it will be seen that 900 tons was charcoal pig-iron.

Resuming enquiries with the present century we find, as previously stated, that the Calder Ironworks commenced operations in the year 1801; these works take a prominent position in the history of the iron trade of Scotland from the circumstance that it was here that blackband ironstone discovered by Mushet was first used as an ore of iron. In the following year, 1802, the Shotts Ironworks was projected under the able management of Mr. John Baird, of the Canal Basin Foundry, Glasgow, who continued to be the managing partner of the concern for upwards of 40 years. At these last-named works in late years it appears Bessemer pig-iron is produced from hematite ore and the use of raw coal.

The returns for the year 1806 are the next to refer to; these show in detail the production of pig-iron in the works of Scotland, and the blast-furnaces then in operation, which were as follows:—

County.	Name of works.	Furnaces.	Pig-iron made—tons.	Average per furnace—tons.
Stirlingshire ..	Carron .....	5 .....	7380 .....	1476 .....
Lanarkshire ..	Calder .....	2 .....	1077 .....	1077 .....
	Clyde .....	3 .....	2687 .....	1343 .....
	Glenbuck .....	1 .....	790 .....	790 .....
	Omoa .....	3 .....	1852 .....	926 .....
	Shotts .....	1 .....	2034 .....	2034 .....
	Wilstontown ..	2 .....	1381 .....	1381 .....
Fife .....	Markinch .....	2 .....	0 .....	0 .....
Ayr .....	Muirkirk .....	3 .....	3043 .....	1521 .....
Clackmannan ..	Devon .....	2 .....	2596 .....	1298 .....
Argyle .....	Goatfield .....	2 .....	0 .....	0 .....
	Bonawe .....	1 .....	1 .....	1 .....

Total .....

Comparing these returns with those of the year 1796 it will be seen that considerable advance had been made to the extent of upwards of 40 per cent. in the yield of pig-iron, the increase in the average furnace make being 1270 tons, compared with 946 tons in the year 1796, equal to nearly 12 per cent.

While noting the make of pig-iron in Scotland in the year 1806, it will be desirable to give the yield of the furnaces of England and Wales in the same year, to enable comparison to be made with previous returns.

County.	Furnaces.	Pig-iron made—tons.	Average per furnace—tons.
Cumberland .....	4 .....	1,955 .....	489 .....
Derbyshire .....	17 .....	9,074 .....	825 .....
Lancashire .....	3 .....	780 .....	780 .....
Leicestershire .....	1 .....	0 .....	0 .....
Northumberland .....	2 .....	2,500 .....	1,250 .....
Shropshire .....	42 .....	54,966 .....	1,832 .....
Staffordshire .....	42 .....	50,002 .....	1,562 .....
Yorkshire .....	26 .....	27,646 .....	1,252 .....
Monmouthshire .....	3 .....	2,240 .....	743 .....
North Wales .....	4 .....	2,981 .....	994 .....
South Wales .....	45 .....	68,867 .....	1,977 .....
Scotland .....	27 .....	22,840 .....	1,270 .....

Total .....

Hitherto no reference has been made to the Devon Ironworks in Clackmannanshire, projected in the year 1792 by Messrs. Roebuck and Longridge, to which a special interest attaches. These works originally had three blast-furnaces cut out of the solid rock, and lined with fire-bricks, and provided with the largest air chamber ever used in an ironworks. This chamber was also excavated out of the solid rock. From Mr. Mayer's interesting paper previously referred to, it appears that at these works between the years 1848 and 1854 the late Mr. Alexander Christie laboured most assiduously to accomplish the utilisation of the gas produced in a furnace using raw coal. He was successful, but his success was gained at the quality of the iron. The Devon Ironworks have long since been dismantled.

[To be continued.]

#### EXPLOSIVE SUBSTANCES.

While gunpowder, that "villainous saltpetre" which men have for centuries dug "out of the bowels of the harmless earth," still maintains the foremost place among explosive substances on the battlefield, where it owes its pre-eminence as a propelling agent to its comparative weakness as an explosive, it has been to a large extent superseded in the peaceful arts by a class of substances much more violent in their action, and of which nitroglycerine and gun-cotton may be regarded as types. These resulted from the discovery that certain organic substances, as cotton fibre and glycerine, when treated with strong nitric acid, which undergoes little or no alteration in their external appearance, became chemically metamorphosed into the most violently explosive substances known. Ordinary cotton waste thus acted upon was transformed into the energetic gun-cotton, while glycerine became the fluid explosive—nitroglycerine. The liquid condition of the latter, however, was found to interfere seriously with its practical use, and to meet this difficulty M. Nobel, a French chemist, sought for and found a siliceous clay capable of absorbing three times its own weight of this liquid compound, the result being the formation of a fairly solid, plastic substance, possessing much of the explosive energy of nitroglycerine, while both safe and more convenient to handle. To this material Nobel gave the now well-known name of dynamite—probably the best understood and partly on this account the safest of modern explosives. The rapid growth of the dynamite manufacture, in spite of such hindrances as the refusal of the railway companies of this country to carry it, although it is so conveyed on the Continent, and that without accident, attests its growing popularity. The total quantity manufactured in Europe during 1867 amounted only to 11 tons, while in 1878 the production has risen to 6130 tons, a quantity which, taking the power of dynamite at four times that of blasting powder, is equivalent in blasting energy to the total quantity of gunpowder used annually in the whole of Europe. The purposes to which dynamite is now applied are exceedingly multifarious, including a great variety of mining and engineering operations, the blasting of submarine rocks and of ice, and the clearing of forests. Some interesting trials of this substance have recently been made in Austria for land cultivation, when it was found that land could by this means be broken up and the soil exposed to a depth exceeding 6 ft., at an expenditure of from 10s. to 12s. per acre. Owing also to its much greater destructive power, all such blasting operations can be carried out with a saving, calculated recently by a German engineer, at from 40 to 50 per cent. of manual labour.

Dynamite, although thus energetic as an explosive, is not nearly as powerful as pure nitroglycerine, owing to the fact that to the 75 per cent. of the latter which it contains 25 per cent. of inert clay is added. It is obvious that if the nitroglycerine could be solidified without the addition of so much, or still better, of any such neutral substance, its explosive power would to that extent be increased, and this would seem to be what M. Nobel has attained in the new explosive recently patented by him under the name of "blasting gelatine." Having discovered that nitroglycerine acted as a solvent

on a mild form of gun-cotton, he mixed 7 per cent. of the latter with 93 per cent. of the former, and thereby succeeded in obtaining a plastic material as convenient for use as dynamite, but much more powerful, since the inert clay of the latter was got rid of, and its place taken by gun-cotton, the new material being thus rendered explosive throughout. Military gun-cotton is the most energetic form of that substance; but unlike the gun-cotton used by Nobel for his blasting-jelly, it is insoluble in nitroglycerine; Prof. Abel, chemist to the War Department, has recently improved upon Nobel's invention by mixing 10 per cent. of military gun-cotton with the blasting gelatine, and has thus succeeded in producing a more solid and a still more powerful explosive. As these are the most energetic explosives at present known, and as they are both produced in a convenient form for manipulation, the blasting gelatines of Nobel and Abel will probably come into extensive use for torpedoes and military mining operations, where the maximum of destructive power is the quality most needed.

The ignorance which prevailed regarding the nature and properties of gun-cotton and nitroglycerine, long after their discovery, led to many lamentable accidents, the occurrence of which created a strong prejudice against the use of these substances, a prejudice which has not yet died out, although, owing to the investigations of Prof. Abel, M. Nobel, and Major Majendie, the behaviour of these explosives is now so well understood that such accidents as still occur can almost invariably be traced to culpable negligence either in the manufacturing, or in the subsequent handling of the explosives. Thus it is well understood that gun-cotton—550 tons of which have been supplied to the British Government during the past five years—if kept damp can be stored in large quantities with perfect safety. Prof. Abel, in a recent address on this subject, stated that, saturated with 15 per cent. of water, gun-cotton might be thrown on a fire without showing any tendency to burn, while large masses of it in this condition might be perforated with a red-hot iron without the slightest danger of explosion; yet all that is necessary in order to render it immediately available for explosive purposes is to apply a small quantity of dry gun-cotton, when, by exploding the latter by means of a fulminating fuse, an instantaneous explosion of the damp material, rendered all the more powerful by reason of its wetness, will take place. The objection which railway companies in this country entertain to the transport of such explosives as dynamite is apparently due to the belief that an explosion is apt to be induced by the more or less severe concussion of the dynamite cases caused by the jolting of the wagons in motion. That this danger, provided the material is properly manufactured, can hardly be said to exist has been proved by such experiments as that of letting a 200 lb. cast-iron weight fall from a height of 30 to 40 ft. on a case of dynamite cartridges, when no explosion has occurred, although the blow was sufficient to crush both the box and its contents. Nitroglycerine if not quite pure, and dynamite freeze very readily, and many of the accidents which have occurred in dealing with these substances, have been supposed to be due to their more explosive character when in a frozen condition.

The report recently issued by Major Majendie on this subject would seem to show that under most circumstances these substances are less sensitive to explosion in the frozen than in the unfrozen condition. Such at least was found to be the case when it was attempted to explode either of them by a sharp blow or by the usual method of detonation. Frozen dynamite, however, was found much more liable to explode by simple ignition than was the unfrozen substance, and this no doubt serves to explain the many accidents which have occurred to miners when hastily thawing their frozen cartridges over a fire; the miner knows that in its normal condition his cartridge may be set fire to without danger of explosion, he is probably not so fully aware of the fact that he cannot count upon such a result in dealing with frozen dynamite. Another difficulty in dealing with these explosives, and one which for a time seemed likely to prevent their ever attaining practical importance, lay in the uncertainty of their exploding so long as the application of fire was the only known method of bringing that about. Explosion by this means necessitated the close confinement of the substance to be exploded, and a comparatively slight modification of the surrounding circumstances might, for no known reason, prevent the explosion altogether. M. Nobel removed the difficulty, and thus rendered possible the present extensive application of these substances by the employment for this purpose of a detonating agent consisting of a small quantity of one or other of those highly explosive substances known as fulminates, an impure form of one of which is used in percussion caps, by means of which that exceedingly rapid form of explosion, to which the name of detonation is now given, could be reckoned on with certainty. That the practically instantaneous character of a detonation—it travels at the rate of 17,000 to 24,000 ft. per second—renders those substances much more effective than when simply exploded by ignition was well illustrated by one of Prof. Abel's experiments, in which the 5 lb. charges of gun-cotton to be detonated were suspended at a height of 4 ft. over plates of soft steel placed upon anvils, having each a large circular cavity in the centre. On the detonation occurring the air was projected with such violence on the plate beneath as to force the metal down into the cavity of the anvil, while a much larger charge of gunpowder, as well as one of loose gun-cotton, placed on the surface of the metal plate and then exploded by ignition, produced no depressing effect whatever.

The NAILSTONE COLLIERY (Leicestershire) was put up for sale by auction on Friday, when the bidding commenced at 18,000l., and was knocked down to Mr. Hall, of London, for 18,250l. Two years ago the colliery was officially valued at 50,731l.

SIR HENRY BESSEMER.—The announcement is made that the Queen has been graciously pleased to confer the honour of knighthood upon Mr. Henry Bessemer. Nothing could more curiously illustrate the way in which we English deal with scientific discoverers. It is not, the reader will observe, the knighthood most worth having—the Cross of the Order of the Bath—which is conferred upon Mr. Bessemer; that is reserved for persons of military distinction, or for political or other official services. Men of science, if they receive any distinction at all, must be content with the same kind of honour that is served out, almost as a matter of custom, to a Lord Mayor, and even he—if he has done anything special—gets a baronetcy. If Mr. Bessemer had been a successful general, an admiral, or a statesman, he would have been made a K.C.B. at least, and would have given him a peerage, if he had won a couple of battles. But, as he has only increased the national wealth enormously by his process of converting iron into steel, and has thus given employment to many thousands of workmen, a simple knighthood is thought good enough; and that if deferred for twenty years after the great discovery has received its application to the iron industries of England and the world. Contrast this tardy recognition at home with the honours conferred upon Mr. Bessemer in other countries. Sweden was the first to recognise the inventor by giving him an honorary distinction. Next, Hamburg presented him with the freedom of the city; no mean honour. Then the King of Wurtemberg sent him a gold medal, and a letter of thanks for his invention. This was followed by a letter from the Emperor of Austria, accompanied with the cross of the Order of Francis Joseph. Twelve years ago, the late Emperor Napoleon, on the recommendation of a scientific commission, offered Mr. Bessemer the Grand Cross of the Legion of Honour, a distinction reserved for those who have rendered services of special eminence. One condition was attached to this offer that Mr. Bessemer should receive permission from his own Sovereign to wear the order, and this permission was refused, so that the Grand Cross was never presented, the Emperor substituting for it a gold medal specially struck in commemoration of Mr. Bessemer's invention. Finally, the Americans, who have largely employed the converting process, founded a city to which they gave the name of Bessemer. At home, all possible honours that the scientific societies can bestow have long since been offered to the great inventor. Mr. Bessemer has also been the recipient of the Albert Gold Medal, presented to him by the hand of the Prince of Wales. It is stated by Blanch, in his History of Camberwell, that in the course of his various experiments Mr. Bessemer has taken out more than 100 patents, and has paid to the Crown as much as 10,000l. for stamps

alone. At last, after the delay of twenty years, the official mind takes cognisance of Mr. Bessemer, and he "receives the honour of Knighthood." It is curious, this way of treating scientific men; and might be instructive—if it were not so common.

#### THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week business has been restricted by the Whitsuntide holidays, but prices are generally firm. In regard to the trade of the country, there is no alteration to report, but there can be no doubt cheap money and a quiet state of political affairs are conducive to a larger trade. It is possible, therefore, that these influences may gradually assert themselves in an improvement in business, although at present the tendency one way or another is very undecided.

In shares of coal and iron companies, Marbella have advanced 3s. 6d. per share; Lochore and Caplehead, 3s.; Arnlston and Clyde, each 2s. 6d.; while Bolekow, Vaughan, A., are reduced 1l. 10s.; and Ebbw Vale, 5s. Bolekow after falling to 25s. 6d. have recovered to 27s. 6d., or a shade higher on the week. Scottish Australian are now ex div., and this company's coal sales for March have been 17,535 tons. Steel Company of Canada are offered. The Leverstone Ironstone Company (Limited) has been formed with a capital of 100,000l., in 100 shares, to acquire ironstone mines and other property near Gulsburgh, in the Cleveland district. Andrew Knowles and Sons (25s. paid) are at 14s. 6d.; ditto (20s. paid), 12s. Bolekow, Vaughan, A., 57 to 58; ditto, B., 33½ to 34½. Chapel House, 20s. to 25s. Chillingham, 35s. to 45s. Carnforth, 81. Consett, 16½. Darlington, 13½. Ebbw Vale, 40s. to 50s. John Brown and Company, 30½. Marbella, 25s. to 28s. Muntz's Metal, 15s. prem. Nant-y-Glo and Blaenau (pref.), 14 to 16. Nerbudda, 10s. Omoa and Cleland, 6s. Parkgate, 27½. ex div. Pilsley, 2½. Sandwell Park, 12. Shepley, 49½. Staveley, A., 10s. 6d.; ditto, B., 10½. Ulverston, 8. West Cumberland, 7. West Mostyn (pref.), 10s. to 11s. Worthington Hematite, 12½.

In shares of foreign copper and lead companies, Tharsis (7l. paid) have advanced 3s. 9d. per share; ditto (10l. paid), 2s. 6d.; and Huntington, 1s. 6d. The principal business in this department has been in Tharsis, which have been firm from 24½ to 22½ all the week, and yesterday it was announced that the directors have resolved to recommend at the annual meeting, on June 15, that a dividend at the rate of 18½ per cent., or 1l. 13s. per 100 shares, be declared from the profits for the 14 months ended March 1, payable in one sum on July 15, free of tax, and that the balance of 12½, be carried forward. For the previous 12 months the dividend was 17½ per cent. The Cape Company also announces a dividend of 12s. 6d. per share, payable June 24. The numbers are published of the Rio Tinto 7 per cent. bonds, drawn for payment July 1. The Yorke Peninsula advalso show very satisfactory progress; the ore returns are 100 tons of 15 per cent. shipped, on hand 285 tons of 14½ per cent., 470 tons of 5 per cent., and 1200 tons of 4 per cent. of 5 per cent. English and Australian, 25s.; Fortuna, 80s.; Llanora, 80s.; New Tharsis, 11; Pontgibaud, 21s.; Rio Tinto 5 per cent., 7½; Yorke Peninsula (pref.), 10s. to 15s.

There is more business doing in home mines, and after having been dull so long it is possible some improvement may now take place. It is believed the Crook Burn Mining Company, whose share list closes on Saturday, will turn out a very good thing. Cwm Brwyno, 40s.; Combarn, 5s.; Carn Brea, 27; Devon Great Consols, 40s.; Dolcoath, 26; East Caradon, 7s. 6d.; Great Laxey, 15 to 16; Herodfoot, 70s.; Killifreth, 5s.; Mynydd Gwddyn, 30s. to 32s. 6d.; Morfaud, 16s. to 17s. 6d.; North Laxey, 2s. 6d.; Pandora, 7s. 9d.; Prince Patrick, 20s. to 30s.; Red Rock, 40s.; South Caradon, 60; Tankerville, 75s.; Tinsford, 9½; Van, 17½ to 17½; West Asheton, 15s. to 20s.; West Chirerton, 40s.; West Helms, 27.

In shares of gold and silver mines, Richmonds are 10s. lower, at 7½ to 7½, and have not been much dealt in all the week. The run is 550,000. The St. John del Rey dividend appears to have been about what was expected, as the shares are unaltered; during the last five years this prosperous company has paid in all 180 per cent. in dividends on its capital of 253,000l., besides setting aside 20 per cent. for reserve. The Don Pedro Company expect to work the slopes at the 40 in a month. The Frontino accounts for March show a profit of 8-10, 10s., and Antioquia, 2s. 6d. per cent. of 25l., which is very encouraging. For Philip a profit of 1.04l. for month ended May 21. Australasian Mines are offered at 5s. Cedar Creek, 2s. 6d. Colorado, 35s. Don Pedro, 20s. Eberhard, 62s. 6d. Emma, 2s. 6d. Exchequer, 2s. 6d. to 5s. Flagstaff, 2s. 6d. to 5s. Gold Run, 6s. 3d. London and California, 12s. 6d. to 17s. 6d. Port Phillip, 8s. to 10s. Rossa Grande, 1s. 6d. to 2s. Santa Barbara, 35s. 6d. to 38s. 6d. South Aurora, 2s. 6d. to 5s. United Mexican, 75s.

In shares of oil companies, Young's Paraffin are 5s. higher, and Uphall 2s. 6d., but Oakbank are 6d. lower. Young's Paraffin are steady at 14l. 1s. 3d. to 14l. 5s., with rather an improving tendency.

In shares of miscellaneous companies, business continues quiet. Brown, Davis, and Company are at 80s. Hauser's Salt, 5s. Native Guano, 55s. Palmir's Shipbuilding, B. 14s. United Limer and Varrolo Asphalt, 25s. Wagon companies shares steady. Scottish still wanted at 9, and the new issued offered at 80s. Birmingham are at 13½. Gloucester (5th issue), 47s. 6d. 1s. Lancaster, 80s. Midland, 8½. Metropolitan, 32s. 6d. prem. Railway Carriage, 72s. 6d. In chemical companies shares, Law's preference and ordinary shares are in request; the latter at 8½. Langdale's, 77s.; Newcastle, 10s.; and Western Counties, 12.

The following calculations show the yield per cent. on money invested at present prices in the shares named, based upon the last average yearly dividends being maintained:—In oil companies Dalmeny would yield 5; Oakbank, old and new shares, each 9½; Price's Patent Candle, 7½; Uphall, 3; and Young's Paraffin, 10½. Arnlston Colliery would yield 8½; Bolekow, Vaughan (stock), 4½; Cairntrable Colliery, 19; Muntz's Metal, 8; Phospho-Guano, 8½; Scottish Wagon, 6½; ditto (new), 6½; Tharsis Sulphur and Copper, 8½; and ditto (new), 8½.

GREYSTONE WOOD MANGANESE MINING PROPERTY.—This company, the formation of which was referred to last week, is making very satisfactory progress. The samples of ore now being turned out are first-class, and some hundreds of tons can be got out at once of this quality. The lode in the western end of the higher shaft is 8 ft. wide, and it is expected to reach 10 ft. by the end of the week. They will work in here until they get the footwall, and then on the lower shafts, where the lodes look equally well. Lode No. 2 contains a large quantity of crystallised ore, which will realise a very high price.

WELSH SLATE QUARRY COMPANY.—This company has lately been started with excellent prospects, and we have obtained the following particulars of it. The quarries are situated in the centre of the slate quarrying districts of North Wales, in the county of Carnarvon. They are pervaded by the same vein as those of Lord Penrhyn's and Mr. Asheton Smith's quarries. The veins are of two colours, blue and purple, and the slates produced are of superior quality. The property is held on a lease, 40 years of which are unexpired, at the low rental of 100l. per annum, merging in an exceedingly low royalty of 2s. per ton on the large sizes, and 1s. per ton on the small sizes. The Crown royalty in the same district is no less than 7s. 6d. per ton. The quarries are worked on the open system, and are two in number. The old quarry, or No. 1, is capable of turning out monthly, if properly worked, from 1200l. to 1500l. worth of slates, and the new quarry, or No. 2, from 750l. to 1000l. They are all untopped, so that no dead expenses in that respect will be required. The only necessary working capital that will be wanted will be about the sum of 1500l. to 2000l. to convert two months' wages to clear the bottom of the old quarry, and to drive a level from the bottom of the old quarry into the new one. This should be done, so as to enable the whole work to be done by one engine, and the cost of driving the level will not be more than 200l. When this level is driven and communicated with the new quarry it will give a depth from the present bottom of the new quarry of about 30 yards, all pure rock. Such a slate cannot be equalled in any other quarry in the district. The property adjoins a station on the London and North-Western Railway, with which it is connected by a tramroad. The buildings, plant, machinery, &c., which are all in excellent condition, have been valued by a London engineer, and are obtained by this company, along with the really good property, at a cheap rate. The capital has been fixed at 20,000l., in shares, and it is expected dividends of 20 per cent. at least can be obtained on the investment.

YOUNG'S PARAFFIN LIGHT AND MINERAL OIL COMPANY (Limited).—The directors' report to be submitted at the fifteenth annual meeting of this company on June 16 has been issued. The balance at credit of profit and loss account for the year ended April 30, is 63,553l., out of which a dividend at 12½ per cent. is recommended, payable in equal instalments on June 20 and Dec. 19, leaving 2725l. to carry forward. The works, pits, and plant of the company have not only been efficiently maintained, but numerous improvements have been carried out, the cost being debited to revenue. The amount thus expended for repairs, renewals, and improved stills, condensers, and machinery generally, has been 20,817l., while the amount written off the capital account for depreciation has been 10,000l. The daily production of crude petroleum in America during the year has averaged 43,809 barrels, as compared with 29,400 barrels and 26,635 barrels for the two previous years respectively. The prices of mineral oils have in consequence been lower in this country than at any former time, while the depression of trade has caused other products of the company to be also reduced in value. The operations were much retarded by an inadequate supply of water last summer, and again during the severe and protracted winter, and thus the maximum production and profit were not obtained. To prevent the recurrence of this, pipes have now been laid from the Addiewell Works to one of the company's pits, whereby an abundant auxiliary supply of water can be had when necessary in future. The capital expenditure for the past year, estimated at 14,500l., has amounted to 14,630l. For the current year the estimate is 24,500l. Of this sum 10,500l. is to be spent in erecting a Lampworks at Birmingham in place of the premises now rented in Edinburgh. This building and the necessary plant will be completed early next year. A considerable saving will be effected by this important change, as Birmingham is the centre of skilled labour, and of the materials requisite in the construction of lamps.

BROWN, BAYLEY, AND DIXON (Limited).—The report of this company for last year shows a net profit of 20,261l., and the balance brought forward was 1439l. A dividend is recommended of 5 per cent., 10,000l., to be placed to a reserve fund, and 3956l. carried forward. Notwithstanding the unexpected and continued depressed state of trade, this company's works have been generally well employed. The directors have effected important economies. They have expended 9941l. in acquiring the freehold of a large portion of the site of the works which was previously held under leases, and they have erected plant for the manufacture of



Bessemer steel for special purposes at a very reasonable cost. It is proposed to issue preference shares to meet debentures falling due.

Per share.	Paid up.	Rate per cent.	Description of shares.	Last price.
£ 10	£ 10	5	COAL, IRON, STEEL.	
10	10	5	Arrol Coal (Limited) .....	5 1/2
10	10	5	Benhar Coal (Limited) .....	2 1/2
100	55	5 1/2	Bolton, Vaughan, and Co. (Lim.) ..	5 1/2
10	10	10	Calcutta Gas Coal (Limited) .....	5 1/2
10	10	10	Chillingham Iron (Limited) .....	5 1/2
10	10	10	Clyde Coal (Limited) .....	3 1/2
25	20	10 1/2	Edwin Vale Steel, Iron, and Coal (Lim.)	6 1/2
10	7	10	Fife Coal (Limited) .....	7 1/2
10	10	10	Glasgow Port Washington Iron & Coal (L)	4 1/2
10	10	10	Prepaid .....	6 1/2
10	10	10	Lochore and Caplethrae (Limited) ..	1 1/2
10	10	10	Marbella Iron Ore (Limited) .....	2 1/2
10	10	10	Monkland Iron and Coal (Limited) ..	2 1/2
10	10	10	Ditto .....	4 1/2
100	100	10	Nant-y-Glo & Blaenau Ironworks pref. (L)	15
10	10	10	Omoa & Cleland Iron & Coal (L. & Red.)	6 1/2
1	1	15	Scottish Australian Mining (Lim.) ..	3 1/2
1	1	15	Ditto New .....	1 1/2
1	1	15	Shotts Iron .....	6 1/2
1	1	15	Ditto .....	6 1/2
1	1	15	Canadian Copper and Sulphur (Lim.) ..	6 1/2
10	7	7 1/2	Cape Copper (Limited) .....	2 1/2
1	1	7 1/2	Glasgow Caradon Copper Mining (Lim.)	2 1/2
1	1	7 1/2	Ditto New .....	1 1/2
1	1	7 1/2	Huntingdon Copper and Sulphur (L.) ..	1 1/2
1	1	7 1/2	Panulicillo Copper (Limited) .....	2 1/2
1	1	7 1/2	Rio Tinto (Limited) .....	8 1/2
20	20	7	Ditto, 7 per cent. Mortgage Bonds ..	15 1/2
100	100	5	Do. 5 per cent. Mor. Deb. (Sp. Con. Bds.)	7 1/2
10	10	20	Thariss Copper and Sulphur (Lim.) ..	2 1/2
10	7	20	Ditto New .....	15 1/2
1	1	1	York Peninsula Mining (Limited) ..	3 1/2
1	1	1	Ditto, 15 per cent. Guaranteed Pref. 12s.	6 1/2
1	1	1	GOLD, SILVER.	
1	1	1	Australasian Mines Investment (Lim.) ..	5 1/2
5	5	10 1/2	Richmond Mining (Limited) .....	7 1/2
10	8 1/2	5	Bromburn Oil (Limited) .....	14
10	7 1/2	5	Dalmeny Oil (Limited) .....	7
1	1	15	Oakbank Oil (Limited) .....	40s. 6d.
1	1	15	Ditto .....	10s. 6d.
1	1	15	Ditto .....	10s. 6d.
10	10	7 1/2	Uphall Mineral Oil (Limited) "A" ..	5 1/2
10	10	7 1/2	Ditto "B" .....	12 1/2
10	8 1/2	17 1/2	Young's Paraffin Light & Mineral Oil (L)	14 1/2
50	25	5	MISCELLANEOUS.	
7	7	10	London & Glasgow Engineering & Iron	
10	10	6	Shipbuilding (Limited) .....	20
10	10	6	Phospho Gumbo (Limited) .....	6
10	10	6	Scottish Wagon (Limited) .....	9
10	4	6	Ditto New .....	60s.

NOTE.—The above lists of mines and auxiliary associations are as full as can be obtained, Scotch companies only being inserted, or those in which Scotch interests are concerned. In the event of any being omitted, and parties desiring a quotation for them, and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.  
Post Office Buildings, Stirling, June 5.

## WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,  
MINEOWNERS, STOCK AND SHARE DEALERS, &c.  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

Ten years ago the weekly information which had previously been published for a great number of years in *Watson Brothers' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and shareholding than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchange at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

WEST SUTTON.—We understand this mine is looking well, and may shortly make good profits. In the 165 west the tin lode is worth 40l. per fathom, the stope in back 50l. per fathom, and when the 177 enters this run of tin ground, which is 65 fms. long, the returns ought to increase. The present returns are about 25 tons of tin and 150 tons of copper per month. There are other good points in the mine which might, perhaps, be worked with more spirit. We have no interest in it, and it is difficult to say what the price of shares really is.

THE PRINCE OF WALES MINE has returned 11,440 tons of copper ores, of the value of 54,873l., and upon a very small outlay per share has paid dividends of 6720l. Numbers of shares were picked up at 6d. to 5s. each, and they quickly rose to 3l. During the time of its prosperity for copper, it was our plan to pay moderate dividends and keep a good balance in hand (1200l.) for a "rainy day." But we were told all at once that the mine was a valuable tin mine, and this part we had been neglecting. Certain parties bought up the majority of the mine, found out tin as they thought, and brought it forward at a general meeting of shareholders—made the meeting believe that the agents had neglected the interests of the company in not working the mine for tin, and, against our strong remonstrances, carried a resolution for the erection of steam stamps, which "used up" all the balance in hand, brought us into debt besides, and ended, as we felt it would, and as the agents felt it would, in ignominious failure. But this was not the worst of it—the increase of water at the 90, on the copper lode, was so great that it soon afterwards overpowered the engine, and the only means of working the mine in depth was to erect a larger one; but having spent all the money in hand, and something more, on the useless steam-stamps, the shareholders refused to provide the necessary funds for a larger steam-engine for the copper, and the bottom of the mine has ever since been under water, though the agents have always had the conviction that there is a good mine there if it could be worked, and large engines are cheap enough now. However, it is so difficult to get in calls from the present body of shareholders that there is no alternative but to wind-up, and the mine, with its machinery, which has cost many thousands of pounds, will be advertised in one lot as a going concern in the *Mining Journal* shortly. In the meantime, to pay the debts off and protect themselves from expensive proceedings and costs it is necessary that all in arrears of calls should pay up at once. To anyone in want of a good spec—for a company, the mine in its entirety offers a good chance. In fact, anyone giving the price (1200l.) as it stands, and

driving the deep adit from "Goodluck" shaft for a few months at a cost of about 40l. per month, would enable the present engine to drain the mine 30 fms. deeper, and would in the meantime intersect good side lodes in the adit.

DUES.—At the Ganton meeting a vote of thanks was passed to the lords, Messrs. Windesta and Bayly, for their continued liberality in giving up the whole of the dues for the last five years, and to Lord Mount Edgumbe for giving up six years' rent of sets due to him. It is a pleasure to record such things as these.

D'ERESBY MOUNTAIN.—We have received information this morning that No. 5 or the deep level has now been cleared and communicated with the Gorse shaft. This work, which has been looked upon as the most important in the mine, has occupied upwards of 12 months, and we shall now, with all speed, get this deep level under the great stope in No. 4, and if found as good as we all reasonably expect, the value of the shares may be doubled or trebled.

WHEAL CREBOR.—We have frequently explained the position of this mine, and expressed the opinion that as the levels were extended east into the new ground a good mine would be opened out; but time, with a little more money, is required. There is a winze now in course of sinking from the 108 to the 120, in which the lode is worth 20l. to 30l. per fathom, and when this is communicated with the bottom level, in about two months, good stopping ground will be opened out, and the returns considerably increased. Sinking below the 120 cannot be undertaken till the new shaft is down. At present the returns are small. The sampling for the two months is 92 tons of 5 per cent. ore, and worth (say) 200l., and the costs are 200l. per month. We, therefore, expect another call of 1s. 6d. or 2s. at the next meeting. After this the mine ought to be made to pay, and shares are a good and a very cheap speculation.

SATURDAY, MAY 31.—Market very quiet, and prices merely nominal. Van, 16 1/2 to 17 1/2; Great Laxey, 15 to 16; Roman Gravel, 8 1/2 to 9 1/2; Aberllyn, 10 to 12; Herodsfoot, 3 to 3 1/2; West Chiverton, 2 1/2 to 3; call paid; Leadhills, 1 1/2 to 2 1/2; Carn Brea, 25 to 27; Dolcoath, 24 to 25; South Condurrow, 11 1/2 to 12 1/2; South Frances, 5 1/2 to 6; West Frances, 5 1/2 to 6; Peavor, 9 to 9 1/2; West Tugus, 25 to 27; Morla Du, 15s. to 18s.; Crebor, 5s. to 7s.; Don Pedro, 18s. to 20s.; Richmond, 8s. to 8 1/2; Santa Barbara, 37s. 6d. to 42s. 6d.

MONDAY, JUNE 3.—Bank Holiday. Market closed.

TUESDAY, JUNE 4.—There is very little business doing, and quotations almost nominal. Aberllyn, 10 to 12; Carn Brea, 25 to 27; Devon Great Consols, 1 1/2 to 2; Dolcoath, 24 to 25; East Van, 1 1/2 to 1 3/4; Gleurol Lead, 7s. 6d. to 10s.; Great Laxey, 15 to 16; Herodsfoot, 3 to 3 1/2; Leadhills, 1 1/2 to 2 1/2; Mellanar, 3s. 4d. to 4s.; Morla Valley, 7s. 6d. to 10s.; Morla Du, 15s. to 18s.; Peavor, 9s. 4d. to 11s.; Roman Gravel, 8 1/2 to 9 1/2; South Condurrow, 11 1/2 to 12 1/2; South Frances, 5 1/2 to 6; Tunkerville, 3 1/2 to 3 3/4; Tincroft, 9 to 9 1/2; Van, 17 to 18; West Bassett, 4 to 4 1/2; West Chiverton, 2 1/2 to 3; West Frances, 5 1/2 to 6 1/2; West Beton, 12 1/2 to 15; West Tugus, 25 to 27; Agar, 3 1/2 to 3 3/4; Crebor, 5s. to 7s.; Grenville, 3 1/2 to 4; Peavor, 9 to 9 1/2; Cape Copper, 27 to 28; Don Pedro, 18s. to 20s.; Panulicillo Copper, 25s. to 27s.; Richmond, 7 1/2 to 8 1/2; Santa Barbara, 1 1/2 to 2 1/2.

WEDNESDAY, JUNE 5.—Market again very quiet, and prices much about the same as quoted yesterday.

THURSDAY, JUNE 6.—Market continues inactive. South Condurrow, 11 1/2 to 12; West Frances, 5 1/2 to 6; South Frances, 5 1/2 to 6; Van, 17 to 18; Roman Gravel, 8 1/2 to 9 1/2; Grenville, 3 1/2 to 4; Herodsfoot, 3 to 3 1/2; East Van, 1 1/2 to 1 3/4; Crebor, 5s. to 7s.; Don Pedro, 18s. to 20s.; Cape Copper, 27 to 29; Richmond, 7 1/2 to 8 1/2.

FRIDAY, JUNE 6.—Market rather firmer for tin shares. Carn Brea, 25 to 27; Dolcoath, 24 to 26; South Condurrow, 11 1/2 to 12; Tincroft, 9 to 9 1/2; Peavor, 9 1/2 to 9 3/4; Grenville, 3 1/2 to 4 1/2; West Frances, 5 1/2 to 6 1/2; West Bassett, 4 to 4 1/2; Van, 17 to 18; Great Laxey, 15 to 16; Herodsfoot, 3 to 3 1/2; Roman Gravel, 8 1/2 to 9 1/2; Tunkerville, 3 1/2 to 3 3/4; Mellanar, 3 1/2 to 3 3/4; Crebor, 5s. to 7s.; Peavor (Copper), 9s. to 11s.; Don Pedro, 18s. to 21s.; Frontino, 2 to 2 1/2; Richmond, 7 1/2 to 8 1/2.

## Meetings of Public Companies.

### LUSITANIAN MINING COMPANY.

The adjourned ordinary general meeting of shareholders was held at the offices of the company, Queen street-place, on Tuesday, Mr. ROBERT HENRY in the chair.

Mr. W. G. WILLIAMS (the secretary) read the notice calling the meeting. The report of the directors was taken as read.

The CHAIRMAN, having explained that the meeting had been postponed in order that all the directors might be present, went on to say—Gentlemen, you have all had an opportunity of reading the report and accounts, and of seeing that we are in a very bad plight. The company has for years past struggled against circumstances which have been uncontrollable. The mine has fallen off to some extent, but the great cause of all our failure has been the great and lasting depression in the price of copper. It has been utterly impossible to carry on works of this description at any profit whatever, and it has been inevitable in carrying them on that they should be attended with considerable loss. We all know that when one gets a property of this kind it is an extremely unpleasant thing to give it up and throw it away, because we know that once thrown away it is gone for ever. The directors have, therefore, gone on hoping almost against hope, I may almost say, but still hoping some favourable turn might come by which they might recover themselves. It was a very good mine for many years; then, as a matter to raise our expectations, we found another metal, named nickel, which supported us to some extent—that has failed, like copper. Therefore circumstances have so militated against us that it has been utterly impossible to do any good with it. About a year ago difficulties stared us in the face, and then Mr. John Taylor was going into the country, and we thought something might be done so as to decide what was the best course to be adopted, therefore we waited before coming to the conclusion that it would be the better plan to stop the affairs of the company, and to close it altogether. Then another difficulty stared us in the face, which we did not at all see or contemplate until it came palpably before us. We were connected as the lessors of Mr. Pinto Basto, and were bound to pay him certain royalties. When came this question—that by the deed the company was bound to go on working the mine, and then, Mr. Pinto Basto having died, the difficulties were so much increased that the directors could not see their way to do one thing or the other, because it was a question whether, if we went into liquidation at that period, the executors would not have come upon us, and put their hands upon the whole thing, and that we should not get a bit of the machinery for the estate and for division amongst the shareholders. These difficulties were, as I said, considered at the moment of so much importance that the whole thing was postponed for consideration from time to time. When Mr. Taylor returned these difficulties were not materially relieved, but Mr. Taylor thought so highly of the property and of the concern that it was with great reluctance we thought we should ultimately have to succumb, and we decided to see whether there was any chance of an improvement in the market. During the early period of the existence of this company there were large tracts of land purchased under the deed with the lessor. The arrangement by which the land was purchased was something of this kind—the company was to have the land necessary for the use of the mine, and they were to pay for it, and to recoup themselves out of the profits due to Mr. Pinto Basto as they occurred. The profits did not occur; and, therefore, the money which had been paid for the land was not repaid, and the company stood possessors of the land. But the lands were bought in Mr. Pinto's name, as the original agreement prescribed, and if the company had then gone into liquidation, and as Mr. Pinto Basto's affairs were not in a satisfactory condition, the land would naturally fall into the names and possession of his executors, and they would have gone upon this land and taken it away, and the company would not even have that. Under all the circumstances there was really no alternative but to carry the thing on until we saw our way out of it. But another thing in the meantime occurred. Mr. Pinto Basto, and consequently his executors, were the owners of 34 per cent. of the profits of this mine, and then came the question whether it would not be desirable for the company to buy their interest, for then we should have a property which could at least be sold, as it would be a freehold property. After very lengthy negotiations that have been accomplished, and the interest of Mr. Pinto Basto's family has been entirely purchased by the company, which now possesses as a freehold property all the mine and all the land which I have described, so at last there is a property for sale which is worth something, but until that had been accomplished there was a property which we could not sell, and which we could not say was worth anything. So far I have brought down the consideration and description of what has transpired, as far as I can, to the present time. So far the directors have done their utmost to carry out all they could for the benefit of the shareholders. The directors absolutely guaranteed payment of all that money to the Pinto Basto family, simply taking a lien upon the property, merely because the company had not the money to pay for it, and they considered that without the purchase of and payment for the property it would be worth nothing at all. It was not until March 6 that the deed was signed. It has been an unfortunate and disagreeable concern for a length of time, and has been a source of the greatest possible anxiety to the directors. We have done our best to make a property of that which was no property at all; we have purchased the interest of the Pinto Basto family, and we have made a freehold property, and now comes the question of what shall be done with it in the future. The directors see no way out of it. We are not going to try and pass this thing off, and say smooth words, and make you believe in a property which I do not think exists. There is no chance of doing any good for the property so long as the metal markets continue as they are. If, as is not at all probable, there should be a sudden turn and prices improve the thing might be worth working, but now it is not worth working, and there is a loss going on month by month, and, of course, it will become larger in the course of the year. It will be a question for you, gentlemen, to decide what you will agree to have done. I shall now propose that the report now presented, and the accounts and balance sheet to Sept. 30, 1878, be received and adopted. I may mention that Mr. Cruickshank, who has been on the mine for many years, is present, and will give any information.

Mr. JOHN TAYLOR, in seconding the resolution, said he went to the mine at the request of the board to see the property, engines, and so forth, and what could be done with them. The map would show that they had a very excellent mine, which began at the

level of the river, where it was very rich, and for some years the company got very good profits, and for a long time they raised great quantities of copper ore, and paid a high royalty to Mr. Pinto Basto. Several of the conditions on which the mines were taken made it compulsory on the company to buy the water and the mill properties upon the line of the river. When the company began to get into difficulties the directors thought most anxiously how they could make the best of the property; he went over, and he found, looking at the complication of affairs in the Pinto Basto family and a variety of other circumstances, the position of the mills and so forth, that there was nothing for it, if they wanted to break up the company, but to buy out the rights of the Pinto Basto family. Well, this had been done, and the company possessed the whole of that property. The mine had produced copper, nickel, and cobalt, but, unfortunately, all these metallic substances had fallen to such a low price that it was useless to contend against it. The mine could be cheaply worked, water-power was abundant, there was a railway within 8 or 10 miles, there were good roads and a passable country, but the price of the ore when it reached this country was so low that the mine could not be carried on without a loss. Therefore the directors had put themselves in a position to sell the property upon the best conditions they could, and he believed that was the conclusion at which they must arrive. When he was there he was delighted to see the condition in which the place was; the machinery was excellent, and the mills and washing-floors in the best possible condition, and it was melancholy to see they could not realise anything out of it, as was done a few years back. He believed the meeting would probably arrive at the conclusion that they should endeavour to bring the affairs of the company to a complete close, and see how the property could be realised for the best advantage of the shareholders.

Mr. RICHARD TAYLOR, in reply to a question regarding the amount due to the directors, said the directors had not been paid, and that there was an accumulation, and he might mention that as the number of directors was reduced by death and other circumstances, so the fees of the directors had been reduced in proportion, and the present remuneration of each director was now 40l. a year, which, however, had not been paid. As regarded the amount due to his firm, it was not their intention to take the full amount, but it was allowed to stand for the present as his firm, with the two other directors, were responsible for the payment of all the bills, and had given their absolute guarantee for them, and he considered it right until those things were settled that these sums should be carried to their credit. After some discussion of an unimportant character the resolution was put, and carried.

On the motion of the CHAIRMAN, seconded by Mr. JUDY, Messrs. John and Richard Taylor were re-elected directors of the company.

It was resolved not to fill up the vacancy on the board caused by the resignation of Mr. Reeves.

On the motion of Mr. DONAGAN, seconded by Mr. PEARSE, Mr. St. John was re-elected auditor.

Mr. St. John said the directors had done their very utmost to carry the company to a success, but had not succeeded in doing so; he, therefore, moved that it appearing the operations of the company could not be carried on without loss the directors be requested to take the necessary steps to wind up the affairs of the company as soon as possible.

Mr. DONAGAN seconded the resolution, and said that possibly the liquidator when appointed would be able to get some offer for the property from a private individual or public company.—The resolution was put and carried.

The CHAIRMAN said a meeting would be called as soon as possible, and then a liquidator would be appointed.

Mr. DONAGAN proposed a hearty vote of thanks to the Chairman and directors. He said he was sorry the operations had not been more successful, but expressed his belief that the directors had done everything which possibly could be done to make the mine a success, but they had been beaten by circumstances against which it was impossible to contend.

The resolution was seconded by Mr. KARCK and carried, and the CHAIRMAN having acknowledged the compliment the meeting broke up.

EAST ROMAN GRAVELS (Lead).—At the statutory meeting of shareholders, held on Wednesday—Mr. William Edwards in the chair—a resolution was passed confirming the agreement for the purchase of the West Tankerville Company's property; and the election of the directors, Messrs. Edwards, York, and Bush, was also confirmed.

LEADHILLS SILVER-LEAD MINING AND SMELTING COMPANY.—At the meeting yesterday of the shareholders the report of the directors was adopted. The position of the company was very clearly stated by Mr. Peter Watson, who filled the chair. He pointed out that the non-accumulation of profits arose entirely from the excessively low price of lead, and not from any falling off in either the quantity or quality of the ore. As a matter of fact, many of the points now being worked are more promising than at any previous period since the company was established, and it may be of interest to remark that, in many respects, the stratification and appearance of the lode strongly resembles those of the celebrated Roman Gravel. It is satisfactory to notice that a considerable reduction has been made in the expenditure, and this has been done without decreasing the efficiency of the work. Not the least important matter for congratulation is the fact that the relations between the company and their workmen are on the most cordial and harmonious footing, and this is a point which will be fully appreciated by those who have had to do with mines where the relations between the masters and men are not so satisfactory. A full report of the proceedings will appear in the next number of the *Journal*.

[For remainder of Meetings, see to day's Supplement.]

## THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London by sea, railway, and canal during May, 1879:—

By sea.	Ships.	Tons.	By Railway and Canal.	Tons.
Newcastle .....	95	79,205	London & North-Western .....	14,646 5
Seaham .....	16	9,030	Great Northern .....	88,341 0
Sunderland .....	25	16,844	Great Western .....	103,326 0
Middlesbrough .....	1	327	Midland .....	184,871 0
Hartlepool .....	54	22,121	Great Eastern .....	70,943 11
Scotch .....	27	20,000	South-Western .....	4,513 12
Welsh .....	12	4,916	London, Chatham, & Dover ..	1,427 0
Yorkshire .....	39	24,891	South-Eastern .....	1,353 4
Sea coal .....	4	2,926	Grand Junction Canal .....	242 15
Clinders .....	2	100		
Total .....	275	181,201	Total .....	600,334 7
Imports—May, 1878 .....	379	229,504	Imports during May, 1878 ..	438,017 8

Comparative Statement, 1878 and 1879.

By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.
Jan. 1 to May 31, 1879 .....	2074	1,401,879	Jan. 1 to May 31, 1879 .....	2,790,620 5
Jan. 1 to May 31, 1878 .....	2131	1,317,890	Jan. 1 to May 31, 1878 .....	2,316,595 2
Increase—1879 .....	57	84,989	Increase—1879 .....	474,024 3
Decrease—1879 .....	57	—		

Exports.	Tons.
Railway-borne coal passing in transit through district .....	102,525
Sea-borne coal exported to British possessions, or to foreign parts, or to the coast .....	19,833
Ditto, sent beyond limits by railway .....	49,859
Ditto, by canal and inland navigation .....	1,807 = 71,134
Railway-borne coal exported to British possessions, or to foreign parts, or the coast .....	32,583
Ditto, by rail beyond district .....	52
Ditto, by canal and inland navigation .....	62 = 32,697
Sea-borne coal brought into port and exported in same ships .....	2,059
Total quantity of coal conveyed beyond limits of coal duty district during May, 1879 .....	208,415
Ditto, May, 1878 .....	149,749

Comparative Statement, 1878 and 1879.

Ditto, Jan. 1 to May 31, 1878 .....	895,374
Increase in the present year .....	60,546
<i>General Statement, 1878-1879.</i>	
Increase in coals imported by railway and canal .....	474,024
Increase in coals imported by sea .....	84,489 = 558,513
Less increase in coals exported .....	90,546
Total increase in trade within the London district .....	467,967



29 tons regulus, 160 tons bars. At Swansea, Florence Danvers, from Lota, 740 tons bars; Red Cross Knight, from Pena Blanca, 760 tons regulus. Stocks of copper (Chili and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingot.	Barilla.
Liverpool	213	20,958	—	—	—
Swansea	1417	6703	3,711	—	—
Total	1447	8761	24,669	—	—

Representing about 28,952 tons fine copper, against 28,550 tons May 15; 20,302 tons May 31, 1878; 15,577 tons May 31, 1877; 10,806 tons May 31, 1876. Stock of copper contained in other foreign ore and Spanish precipitate, 982 tons fine. Stock of Chili copper in Havre, 4289 tons fine, against 8860 tons May 31, 1878; stock of Coro Coro barilla in Havre, 478 tons fine, against 1780 tons May 31, 1878; stock of Chili copper at sea and chartered for to date, 13,400 tons fine, against 8800 tons May 31, 1878; stock of foreign copper in London, chiefly Australian, 7570 tons fine, against 6553 tons May 31, 1878.

Liverpool, May 31. HARRINGTON, HORAN, AND CO.

The stocks of Chili copper produce remaining unsold on May 1 were—Ore, 1447 tons; regulus, 8761 tons; copper, 3249 tons. During the month the arrivals were—Regulus, 760 tons; copper, 740 tons; and the private sales were—Regulus, 1239 tons; copper, 428 tons. The present stocks are—Ore: Chili, 1447 tons; Cape, 1075; Betts Cove, 1080; Australian, 250; Spanish, 10; Portuguese, 225; British, 103—4280 tons; regulus, 5564 tons; copper, 3581 tons. These totals represent about 6950 tons fine copper. No public sale has been held during the past month. On May 7 a parcel of 400 tons of Cape ore fetched an average of 10s. 5½d. per unit for 30% per cent. There have been several private sales of furnace material—about 1500 tons of Chili regulus at 11s. 3½d.; a great portion of this for distant arrival; 580 of Bolivian at 11s. to 11s. 1½d.; 1220 tons Bolivian ore at 10s. 9d.; 460 Mexican ore at 10s. 9d.; 1045 New Quebrada at 10s. 3d. to 10s. 6d.; about 1000 tons of Spanish precipitate at 10s. 6d. to 11s. 3d.; and 160 tons of English at 11s. 3d. to 11s. 4½d.; and 2500 of Betts Cove ore at 10s. per unit. The Chili charters advised for the first fortnight of May are heavy, being 3800 tons of metal, all for England except 50 tons, which go to France. The next advice is not expected for a few days, and it is anticipated to be a large quantity, as it is reported that the executor of the late A. Edwards is transferring their metal to Europe for the sake of security. There has been a very fair trade done in Chili bars at from 55s. to 57s. according to mark.

RICHARDSON AND CO.

The imports of copper for the first four months of the year show an increase over the corresponding period of the past four years; whilst the exports, though 1400 tons less than during January to April, 1878, show a decided advantage in comparison with the three preceding years. The stocks, inclusive of chartered from the West Coast, and afloat from Australia, are the largest on record in the annals of the copper trade, and show an increase on the month of 400 tons. The price of copper has fallen steadily throughout the last twelve months, and we are back to nearly the lowest point touched during the financial panic last autumn. Of furnace material from the West Coast the supply has become limited, and should the demand for English sorts again increase, the future price of copper may be regulated for a time more from the basis of furnace stuff than other sorts; already ore and regulus are bringing higher proportionate prices than bars. It is more than probable, also, that the state of war in South America will begin really to affect the supplies of copper. It has taken but little to raise the price of cotton 50 per cent, and silk 33 per cent, in a very few weeks. A change may come over copper in as short a period. The more so as the silver question, both West and East, in the supply of copper as well as in its demand is now so great an element in the calculation, and this question is only now commencing to operate. There have been so many false starts towards an upward movement of copper that it seems almost vain to believe that the metal has a future, but there is so much now to check any further depreciation that the turn may be at hand.

We subjoin our usual monthly statistics:—The imports of copper into England for the first four months of the following years were: 1875, 29,688 tons; 1876, 21,705; 1877, 29,774; 1878, 28,280; and 1879, 31,824 tons. The exports for the same periods were: 1875, 14,910 tons; 1876, 15,764; 1877, 17,204; 1878, 19,800; and 1879, 18,495 tons. The position from June 1, 1878, to June 1, 1879, was as follows:—

	Stock, including afloat and chartered.	Advised by mail only.
1878—June 1	£ 64 10 0	Tons 27,410
July 1	64 10 0	28,983
August 1	61 10 0	28,913
September 1	60 11 0	28,676
October 1	60 0 0	29,097
November 1	57 0 0	29,712
December 1	59 0 0	29,008
1879—January 1	59 0 0	29,008
February 1	55 0 0	29,538
March 1	55 0 0	29,452
April 1	56 0 0	29,752
May 1	56 0 0	41,624
June 1	55 0 0	41,369

And the comparative positions at the same date of the past four years with the present:—

	Price.	Stock.	Stock, including afloat and chartered.	Advised by mail only.
1875—June 1	£ 83 0 0	Tons 23,570	Tons 29,688	Tons 29,688
1876—June 1	78 0 0	22,682	20,997	20,997
1877—June 1	69 0 0	29,342	34,844	34,844
1878—June 1	61 10 0	27,410	42,809	42,809
1879—June 1	55 0 0	41,369	48,432	48,432

The charters to May 31, 1879, were 20,600 tons, against 18,450 tons in 1878. London, June 6. HENRY ROGERS, SONS, AND CO.

The advice of large shipments and charters from the West Coast had a depressing effect on values, and the price of Chili bars has fallen to 55s., at which, however, there is but little offering. Charters for the first half of May were advised as 3800 tons, and for the second half 1900 tons. We quote—Chili bars, 55s.; Wallaroo and Burra, 62s.; tough, 60s.; manufactured, 65s. to 67s.; ore and regulus, 10s. 6d. to 11s. 6d. per unit. The imports and exports for the four months, January to April, were by the Board of Trade Returns:—

		1879.	1878.	1877.
IMPORTS.				
Ore	Tons	28,974	24,140	25,405
Regulus	Tons	11,812	11,422	11,422
Copper	Tons	16,844	15,833	14,025
EXPORTS.				
Foreign raw	Tons	4,430	4,435	5,680
English raw	Tons	5,271	7,133	3,603
Manufactured, including yellow metal and brass		10,691	9,012	9,291

London, June 6. FRENCH AND SMITH.

## THE TIN TRADE.

	April 30, 1879.	May 31, 1879.	May 31, 1878.	May 31, 1877.
Straits and Australian, spot.	Tons 9,849	10,188	9,336	8,311
Ditto, landing.	675	470	454	1,211
Straits afloat	575	370	131	328
Australian afloat	1,556	1,139	2,085	2,558
Banca, on warrants	1,744	2,029	1,499	1,434
Billiton, spot	2,175	1,908	1,698	1,143
Ditto, afloat	1,150	1,130	1,230	900
Australian tin in Holland	236	208	428	700
Total	Tons 17,963	17,431	18,579	16,585
Deliveries during the month in				
London	1,098	1,104	1,081	1,059
Ditto, Holland	795	777	475	385
Total	Tons 1,824	1,881	1,556	1,444
Shipments during the month from				
Straits	Tons 475	210	45	110
Ditto, Australia	670	318	1,041	1,095
Shipments from Straits to London		2,135	1,775	1,659
Shipments from Australia to London		2,908	4,120	4,297
Deliveries of foreign tin in London		5,437	5,209	4,907

Banca in Trading Company's hands and afloat, 1415 tons. London, May 31. A. STRAUSS AND CO.

We have to report a dull market for Tin during this month, and prices again show a decline of 1½d. to 2d. No new feature has presented itself. Stocks continue to accumulate, and on May 1 had reached the unprecedented total (both here and in London) of about 20,000 tons against 16,000 tons in 1875. Large quantities are still being held off the market by the Syndicate, and to this circumstance it may be safely attributed that the fall in price has not been greater. The recent failures in this place have not affected the value of the metal. The Dutch Trading Company's third sale in 1879 took place on May 27, when 53,428 slabs Banca were sold from 39½d. to 39¾d., average 39 55. Next sale will be held towards the end of July. With very little business the price of Banca declined from 41½d. to 39½d. Since the sale there are sellers at 39½d., but no buyers above 39½d. The demand for parcels of Billiton on the spot has been satisfactory, the price declining from 41d. to 39½d. Forward deliveries continue to command ½d. more, but are sparingly offered. There are now buyers of warrants at 39d. On Monday, June 9, a public sale, comprising 30,000 pounds, will take place at Batavia. The position of Banca tin in Holland on May 31, according to the official returns of the Dutch Trading Company, was:—

	1879.	1878.	1877.
Import in May	Slabs 10,923	15,884	2,904
Total five months	67,268	43,122	52,983
Deliveries in May	14,300	8,701	6,200
Total five months	51,328	43,695	53,890
Stock second hand	64,920	47,981	45,940
Unsold stock	28,435	15,011	7,025
Total stock	93,355	62,992	52,965
Afloat	10,900	10,400	8,975

Statement of Billiton:—

	Slabs	714	5,000	6,478
Import in May	43,998	53,245	38,845	38,845
Deliveries in May	9,431	10,619	6,098	6,098

The Government Returns for the months of January and February are:—

	Stock	35,551	38,034	32,823
Total five months	35,551	38,034	32,823	32,823
Afloat	10,900	10,400	8,975	8,975
Quotation Banca	39½d.	39½d.	42½d.	42½d.
May 31, Billiton	39½d.	39½d.	41½d.	41½d.

These combined returns of Banca and Billiton for 1879, compared with those for 1878, exhibit—A decrease of the import for May of 289 tons; an increase of the import for the five months of 468 tons; an increase of the deliveries for May of 135 tons; an increase of the deliveries for the five months of 39 tons; an increase of the stock second hand of 765 tons; an increase of the unsold stock

of 357 tons; an increase of the total stock of 1113 tons; no change in the quotation of Banca, but an advance of the price for Billiton of 3½d. per ton.

EXPORT OF TIN FROM HOLLAND.

	1879.	1878.	1877.	1876.	1875.
Germany	Tons 140	249	223	741	680
England	168	7	59	176	23
Belgium	74	114	138	354	439
France	12	40	32	55	74
Hamburg	20	16	35	66	178
United States	—	—	19	20	—
Other countries	—	32	16	3	55
Total	412	493	539	1400	1355

Rotterdam, May 31. EBBELING AND HAVELAAR.

During the first half of the past month prices drooped, and foreign sold at 66d. and English ingots at 65d., later the tendency was to higher rates. Owing to the very large deliveries and light shipments the statistics this month present several features favourable to a rise in values. From the figures given below it will be seen that the total visible supply shows considerable decrease as compared with last month; the deliveries of Straits and Australian during the first five months of this year exceed the shipments, and the shipments from Australia during the same period show a falling off of 1170 tons as compared with last year; on the other hand, available supplies show a slight increase owing to heavy steamer arrivals from Australia, but these figures will be reduced during the present month. Deliveries from London were 1098 tons, and from Holland 777 tons. Below we give our usual statistics:

	1879.	1878.	1877.	1876.	1875.
Foreign in London	Tons 10,518	10,558	9,815	9,501	9,501
Banca in Holland	1,744	2,030	1,499	1,435	1,435
Billiton in Holland	2,177	1,904	1,630	1,145	1,145
Afloat for Europe, Straits, advised by mail					
and wire	610	415	170	50	50
Afloat, Australian ditto	1,420	1,150	1,800	2,200	2,200
Afloat, Billiton	1,125	1,000	825	750	750
Banca in Dutch Trading Co.'s hands	1,121	1,000	825	750	750
Banca afloat, by sailing vessels	659	651	375	290	290
Total	19,409	18,700	18,614	16,111	16,111

June 5. FRENCH AND SMITH.

## FOREIGN MINES.

RICHMOND CONSOLIDATED.—Telegram from the mine at Europa, Nevada: Week's run, \$50,000, from 875 tons of ore. D. R. bars from refinery, \$43,000.

R. Rickard, May 14: Since my last operations both in the mine and smelting works have been carried on with the usual regularity. The 200 cross-cut has been drifted 25 ft.; the present end is in limestone, with seams filled with discoloured line and ledge matter. The 400 quartzite drift has been extended 23 ft. without any particular change to mention. The 600 south cross-cut has been drifted 24 ft.; the present end is in hard limestone. The 600 south, from shoot, has been extended 33 ft. without any notable change in the ground; it will take about four weeks to intersect the quartzite, when this ground will be thoroughly explored. The 600 north, on fissure, has been extended 17 ft.; work in this drift has been suspended, and a contract let to extend the 600 west main drift. The 900 north cross-cut has been drifted 19 ft., the end still in the same character of ground. In drifting north from No. 12 chamber, we are going on very satisfactorily, and are making in the northern end of the same, and have very good indications for ore making in this direction. The chambers are looking about the same, and turning out the usual quota of ore.

DON PEDRO.—Extract from Capt. Vivian's letter, May 4: Mine: Bryant's Section 27: This is a part of the mine which for some time since, judging from the extent of lode unexplored, and shown by plan, I thought deserved a further trial; therefore, recently having a small force available for that purpose, we have cleared and secured Bryant's cross-cut 4 ft. from entrance of level to the lode, which seems to be a part of the lode. The lode and body matter is large, but, as far as seen, in places split into branches. By extending operations here, these branches may be found united, and the lode become better defined; under such circumstances, a great improvement is anticipated. I scarcely need state that similar results have occurred in various explorations during the last three years. This part of the mine being high and dry can be worked very cheap, as nearly the whole of the work can be done by Brazilians and blacks; besides, the ground does not require heavy timber, that supplied from the company's woods will answer the purpose. With a view of carrying out operations in this part of the mine, a railway has been laid down 90 fms. in length for transport of ore. In about ten days from now we shall, I hope, be in position to work at least three stops in this ground; the ore to commence with will, of course, be of low quality, but may improve in some of the stops even by extending sufficiently far for one set of timber (6 ft.).

The repairs to the 6-ft. iron wheel are being pushed on with all speed. Within a fortnight from this date I hope it will be so far completed and strong enough to work the 15 in. plunger lift. I am very anxious to accomplish this to fork the lode in driving a short cross-cut from side level to the lode, for convenience of transit of ore, and for room to put in larger size timber for stopping. Bryant's Stope: A stope commenced on the pillar or body of ground; the lode is somewhat irregular and bumpy, but far better quality than that of south side openings.—Prospective and Running Work: In No. 1 incline shaft three new sets have been put in and old ones cut out, as they were badly crushed. In No. 2 incline shaft two new sets have been put in, and the south side of incline built with short timber. Two props put in No. 1 side level. Three sets put in No. 2 side level, and level opened and lathed. In new level four sets have been put in, and level opened 22 ft. in length. Several repairs made in the side level. Bryant's cross-cut and level cleared out, newly lathed, sets put in, and opened in place for 103 fms.—71 fms. in level, &c., and 32 fms. from entrance of level to shoot pass. A cross-cut has been driven 5 fms. in length from main level to stope for convenience of putting in larger timber in stopes, and transit of ore therefrom.—No. 1 Shoot Pass: Alice's level has been cleared around shoot pass, and two strong sets put in from Alice's level to take up the shaft securely, and every set in shaft or shoot. Pass studded strongly from that horizon to surface, and shoot pass cleared and timber renewed 4 fms. in length below Alice's.—Surface: Roads repaired, and faggots been cleared, &c.—The 60-ft. Wheel and other Machinery: Several living changed and other repairs made, and a new roll put in under expansive loop, and all other works in connection with repairs of 60-ft. wheel being pushed forward vigorously day and night, and advancing well.

ANUQUIA (Frontino).—The directors have advised under date April 15, accompanied by a remittance of gold valued at 1257½, the produce of the mines and of the gold purchased at the mines for the months of January, February, and March. The statement of the profit and loss for the month of March shows a profit of 251½. The news from the mines is going on very satisfactorily, the average produce per ton being 1 oz. 4 dwts., and the produce from the Silencio Mine reaching to as much as 3 ozs. 10 dwts. The drawback to this news is the flood at the Silencio Mine, as to which Mr. White tells us that he and his brother, with their assistants, were on the spot immediately, and that the damage was stopped. He adds that by the same night the mine was not only made relatively safe against further harm but all the work was cut out for the next day for fixing new pumps, laying down launders, &c.

FRONTINO AND BOLIVIA.—The directors have advised under date April 15, accompanied by a remittance of gold valued at 8000½, the produce of the mines and of the gold purchased at the mines for the months of January, February, and March. The statement of the profit and loss for the month of March shows a profit of 251½. The news from the mines is going on very satisfactorily, the average produce per ton being 1 oz. 4 dwts., and the produce from the Silencio Mine reaching to as much as 3 ozs. 10 dwts. The drawback to this news is the flood at the Silencio Mine, as to which Mr. White tells us that he and his brother, with their assistants, were on the spot immediately, and that the damage was stopped. He adds that by the same night the mine was not only made relatively safe against further harm but all the work was cut out for the next day for fixing new pumps, laying down launders, &c.

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1½ in. hole in five minutes in hardish porphyry. When I bring the feed water to the reservoir by pipe, and so dispense with pumping from the Creek, I shall effect an immense saving in wood.—Foreman's Report: I herein submit my report for the week ending May 10. Total distance from Monument to face of tunnel 254 ft., distance run for the week 35 ft. (with one shift equal to 150 ft. per month, or 300 ft. with two shifts, L.C.), number of blasts fired 7. The work is running quite up to my expectations when you take into consideration the material in the men, as they are all inexperienced at this work. I have only been able to run one shift, owing to the disadvantages we labour under in obtaining men, being so remote from the railroad, and my object is to get a good class of men that will stay with us, for the trouble is great as well as the delay in the work when I have to break in new men every few weeks. I am doing my best to obtain the right sort of men, and I am in hopes in my next report to be able to say that both shifts are full of good men. Our great difficulty is and will be taking away the rock, for I can work only a certain number of men. If the tunnel had been smaller we could not have run so many, and consequently our progress would have been less, L.C. The machinery is all running satisfactorily, and when everything is systematised, will be able to run the whole thing at small expense, including labour, fuel, powder, oil, &c. And then I would wish you to compare expenses with the like kind of work which has been or is being done in California or Nevada. I would urge the immediate putting in of water-pipe I suggested in my monthly report for April.

PITANGUI.—Mr. T. S. Treloar, Pitangui, May 1: We have found in sinking an exploratory winze in the broken ground ahead of our shafts that the water in the Jacotinga is nearly 6 fms. higher than in the said shafts, thus showing that the pressure of the water through the end of the cross-cut driven from No. 2 shaft is to some extent intercepted by the day in the hanging wall of the lode; in view of this, there is not much likelihood of our being able to resume sinking, nor to advance the cross-cut until the communication with the adit is effected, which latter I need hardly say is being pushed on with all speed, seeing that without an outlet for the water still above us any attempt to intersect the Jacotinga even at a shallow horizon would be useless. The auriferous line discovered at surface is, we find, a very small one; but it is well defined, and may improve in depth. We have obtained from this line to date some nice stones (specimens), and 2 ozs. 11 dwts. of gold.

SENTEIN.—May 31: The manager reports as follows:—We beg to inform you that everything goes well at the mine, where we have broken this week about 120 tons of silver lead and blende ores. There is no change to note in any part of the lode. We have sunk the winze about 3 ft. more below the No. 3 St. Eugene level, and have risen from the back of the No. 4 level about the same distance. We have bored through and let down the water, and in a few days we shall have effected a communication between the two levels, when we shall have good ventilation and be enabled to largely increase our returns of ore with the same number of men employed. We are making good progress in driving the No. 4 St. Eugene level end, which is as rich as ever, and will open a piece of good solid wing ground. We are glad to say that our No. 1 dressing floor is completed, and the machinery thereon is in full working order, and dressing ore for market. The same remark applies to the No. 2 floors. We will send you samples of dressed ore for assay in the course of a few days. Weather at present changed for the better, fine and warm, and the snow melting fast. Should it continue we shall be able to complete the road to the mine and begin bringing down mineral in a very short time. The total quantity of ore raised to the present date is 2705 tons.

SENTEIN.—May 2: Report: The sinking of the engine shaft below the 175 has gone on without interruption; the ground continues favourable. The 175 metre level south is in a hard, regular lode, yielding a little saving work. The same level north is unproductive. The 150 metre level south has met with some cross veins, yielding stones of ore, but the main part of the lode is unproductive. The lode in the same level north is improved in appearance, being composed of jointy quartz of a kindly nature.—Virginia's Lode: The 100 metre level, both north and south of cross-cut, continues unproductive. The rise in back of this level has been holed to the winze from the 80, thereby establishing a good ventilation. The rise in back of the 80 north is unproductive. The 50 metre level south yields a little saving work. The under cutting of the lode in the 80 and 60, north of Brugier's winze, yields from ½ to 1 ton of ore per current metre. The 40 metre level, north of the same point, yields a little ore irregularly. The winze below the same level south yields ½ ton of ore per current metre. The 40 metre level, south of Mill shaft, yields a little ore stuff of low quality. At La Roche the tribute ground in back of intermediate level continues to yield fairly.—Miche Bouse: The sinking of the new engine shaft below the 140 metre level has gone on slowly, the rock being hard and wet. We are now deep enough for the sinking of the 100 metre level, which is now being done. The 140 metre level south is in a strong lode, composed of quartz spotted with ore. The 120 metre level south is unproductive. The 100 metre level south is in soft unproductive ground. The 80 cross-cut east is in easy ground.—Pranal: The 110 metre level, south of St. George's shaft, continues in a strong lode, yielding ½ ton of ore per current metre. The rise in the same level north yields ½ ton of ore per current metre, but we are obliged to suspend it and hole it by the winze from the 90 because of the large quantity of gas issuing from it. The 90 metre level north is unproductive. The same level south, on the east of George's winze, yields a little saving work. Grange's winze, below the 90, yields ½ ton of ore per current metre. The 70 metre level, north of St. George's, yields a little ore stuff, but the lode is disordered by a cross-vein. The same level south is poor. The 50 north yields ½ ton of ore per current metre. The same level south yields a little low quality ore-stuff.—Surface: We have had no serious interruption in our dressing department, and the samplings have amounted to 257½ tons. There is no change to notice in the adit level at Lavergne; the lode continues regular and strong.

SENTEIN.—May 28: In the 115, east of the Winze, the lode is very good, consisting chiefly of carbonate of lime, and yielding good stones of ore; worth ½ ton per fathom. In the 135, south of Pell's, the men are getting on well with this cross-cut. The lode in the 120, west of Pell's, is regular and well defined, yielding 1 ton per fathom. In the 90, west of Pell's, the lode is improving, worth 1 ton per fathom. The 120, east of Pell's, is opening up a good length of stope ground, valued at 1 ton per fathom. In the 105, east of San Francisco, the lode is small, but very compact and regular, producing 1 ton per fathom. The lode in No. 239 winze has fallen off in value during the past week. The 90 winze below the 100 is holed to the 115; lode worth 1 ton per fathom. In No. 231 winze below the 90, the lode is improving a little in this winze; valued at ½ ton per fathom.

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# The Nava de Jadraque Gold and Silver Mining Company

(LIMITED).

PROVINCES OF GUADALAJARA AND MADRID, SPAIN.

Incorporated May, 1879, under the Companies Acts 1862, 1867, and 1877, whereby the liability of shareholders is limited.

CAPITAL £40,000, IN 40,000 SHARES OF £1 EACH.

ISSUE OF 18,000 SHARES OF £1 EACH.

The subscribers to this issue only will be granted by the vendors one fully paid £1 share for every five shares applied for and paid up as a bonus.

They also guarantee to the subscribers of this issue a minimum dividend of 12 per cent. for one and a half year, payable quarterly on the amount paid on the shares, by a deposit of the requisite amount in trust for that purpose with the company's bankers at the time of the issue of these shares.

The 18,000 shares can be paid up as follows:—

£0 2 6	per share on application.
0 10 0	" allotment.
0 7 6	" three months after.
£1 0 0	

The subscriber may, however, on notifying the same on the application form, pay up the balance of 7s. 6d. per share to suit his convenience, spread over twelve months.

Any future issues of shares will not be entitled to the bonus shares nor the guaranteed interest, and will not be issued at less than 10s. per share premium; therefore, early application for this issue by those desirous of securing an allotment is recommended. The date of receipt of application will have priority of allotment.

The whole of the legal and other preliminary expenses up to allotment are paid by the vendors, there being no promotion fees.

## DIRECTORS.

EDWARD COTTAM, Esq., Assoc. M.Inst. C.E., Horn Park, Lee, Kent.  
C. MAITLAND TATE, Esq., C.E., George-street, Langham-place, W.  
The Hon. JAMES TOBIN, 14, Alexander-square, Belgrave, S.W.  
HERBERT J. HILL, Esq., South Hill Park, Hampstead.

N.B.—The directors receive no remuneration for their services until the first dividend of 20 per cent. has been declared.

## SOLICITOR.

THOMAS M. CRIDGE, Esq., 26, Bishopsgate-street Within, E.C.

## AUDITORS.

Messrs. WM. BROOKS and CO., 57½, Coleman-street, E.C., public accountants.

SECRETARY—FRED. C. DYER, Esq.

OFFICES,—10, BUSH LANE, LONDON, E.C.

This company is formed for the purpose of acquiring and working certain gold and silver mines situated in the Nava de Jadraque and at Robredarcas, in the province of Guadalajara, and in the Gargantilla, province of Madrid, Spain, several hundred thousand square yards in extent.

This company's gold mines have several advantages over others in this district, particularly by being situated on the banks of the River Sorbe, thus possessing every facility for washing the quartz when crushed at a minimum of expense. Robredarcas is in close proximity to the railway station, about sixty miles north-east of Madrid, on the direct line from that city to Saragossa.

The only contracts entered into are two agreements dated respectively April 24, 1879, and made between Charles Hart and John Ward of the one part, and Joseph Jones Heath, on behalf of the Nava de Jadraque Gold and Silver Mining Company (Limited), of the other part.

One piece of quartz rock from the Nava de Jadraque, weighing 30 lbs., has already been analysed by the Royal School of Mines, London, and was found to contain—

Gold ..... 12 ozs. 19 dwts. 13 grs. per ton of 20 cwt.

Silver ..... 5 ozs. 16 dwts. 20 grs. per ton of 20 cwt.

Another piece of quartz rock analysed by Messrs. Johnson, Matthey, and Co., assayers and melters to the Bank of England, Her Majesty's Mint, &c., was found to contain—

Gold ..... 38½ ozs. per ton of 20 cwt.

Silver ..... 18 ozs. per ton of 20 cwt.

In their certificate of assay Messrs. Johnson, Matthey, and Co. also state that the produce of silver per ton of 20 cwt. of the Gargantilla surface ore was found to be 20 ozs. 12 dwts.

Both the assays mentioned above fall far short of the results obtained at the School of Mines in Madrid and at the foundry L. Constate, which showed over 440 ozs. of gold and 320 ozs. of silver to the ton of quartz; this is no doubt accounted for by the former having been taken promiscuously from the mines, while the latter was from picked specimens.—See Senor Soler's report enclosed.

One English company has already been formed to work mines at Nava de Jadraque, adjoining mines of this company, called the Guadalajara Gold and Silver Mining Company of Spain (Limited), the shares of which have never been offered to the public, and cannot now be obtained, except privately, and as a favour, the result of their operations being far beyond their most sanguine anticipations.

Although gold was produced in large quantities from this district by the Romans during their occupation of Spain these mines have only recently been re-discovered; we are told that the ancient Roman Imperial Guards had helmets and breast-plates of solid gold, supposed to have been produced from their mines in Spain; the old Roman workings found in the Nava de Jadraque prove that gold was found here.—See Senor Soler's report.

The district of Gargantilla is justly renowned for its rich silver mines, and the recent reports made upon them by the late eminent

French mining Engineer, M. Jules P. Tierney, as well as by Mr. W. Eddy, of Cornwall, who have inspected the property, will be read with interest by all those acquainted with mining matters.

M. Jules P. Tierney in his report states that the average yield of the lodes after the first dressing is about 5 tons per cubic fathom, estimated at £20 per ton. The total cost of obtaining, dressing, and smelting the ore into silver bullion, fit for sale at the Royal Mint at Madrid, would including the carriage thereto not exceed £10 per ton. The shafts being already sunk and the levels driven at great cost have opened up reserves of ore estimated at nearly £400,000 sterling. The daily yield of ore after the erection of the machinery is estimated at 20 tons. This yield could be increased to 200 tons or more daily, showing an enormous return on the entire capital of the company. The common ore at surface, estimated to contain 15 to 20 ozs. of silver per ton, is valued at £90,000. For further particulars, see extracts from M. Tierney's and Mr. Eddy's reports.

According to the reports furnished by the Mining Department of Ballarat, Australia, and published in "Symth's Gold Fields," p. 291, quartz rock yielding only 2 dwts. 10½ grs. of gold per ton has enabled the companies working same to pay dividends; therefore, when it is considered that the quartz rock of the Nava de Jadraque produces a minimum of 12 ozs. of gold and 5 ozs. of silver per ton, and the maximum of 440 ozs. of gold and 320 ozs. of silver to the ton of quartz (Mr. Soler in his report gives proof that the quartz on several assays has yielded this fabulous quantity), the directors unhesitatingly believe that the profits will be enormous, and the shares must go to a high premium as soon as the auriferous nature of the quartz rock in this company's district of Spain becomes better known and appreciated.

Investors must not overlook the fact that, whereas in most mining properties there is uncertainty in finding the lode, &c., the properties acquired by this company are of a totally different description, since the gold and silver are present in the quartz in such large quantities that the undertaking cannot be looked upon as a speculation. There is every possibility of an investor holding even one £1 share thereafter deriving a good income therefrom, whilst 12 per cent. is the guaranteed interest, commencing from the date of allotment. The vendors, not having sufficient means to develop and work the properties, reluctantly consented to form a company, with a moderate capital, which will be amply sufficient for all purposes.

Agreements with vendors and Memorandum of Association can be inspected, and all information obtained, at the offices of the company.

Should the allotment be less than the number of shares applied for, the balance of the application money will be credited to the amount payable on allotment; should the allotment not be made, the deposit will be returned in full.

Full Prospectuses, with Reports and Forms of Application for Shares, can be had from the Secretary, 10, Bush-lane, Cannon-street, London, E.C.

## THE HOLLOWAY PROCESS OF SMELTING.

Mr. A. H. ALLEN, F.C.S., borough analyst, read a paper before the Literary and Philosophical Society of Sheffield on the Holloway process of smelting sulphurous ores without employing carbonaceous fuel.

Mr. ALLEN remarked that prominent among the minerals which were utilised as ores of heavy metals we have the combinations of the different metals with sulphur. The principal ores of all our ordinary heavy metals except manganese and tin are sulphides. As both sulphur and iron are combustible it is not surprising that pyrites can be burnt, and it is burnt largely by the manufacturers of sulphuric acid. Although it was well known that pyrites minerals were readily combustible Mr. Holloway appears to have been the first to conceive the idea of utilising the heat produced by their combustion to smelt the ores, and so enable metallurgists to avoid the use of carbonaceous fuel. Mr. Holloway finds that by blowing a blast of air through molten sulphide of iron from cupreous pyrites the iron and a portion of the sulphur are oxidised, and if the process be arrested before the combustion is complete a heavy mart or regulus is obtained, which contains but a small proportion of the iron of the ore, but practically the whole of the greater part of the copper and other less oxidisable metals. In one of these experiments the temperature was kept up for as long a period as ten hours without the use of any extraneous fuel, the heat being entirely derived from the oxidation of the iron and a portion of the sulphur of the lumps of pyrites which were constantly thrown into the mouth of the converter. There was no reason why this might not have been continued for an indefinite time. In applying this new method to cupreous iron pyrites, Mr. Holloway obtains four products. These products are as follows:—1. A mart or regulus containing from 30 to 50 per cent. of copper, together with the whole of the precious metals present in the ore.—2. A slag consisting essentially of silicate of iron, which is produced by the combustion of the oxide of iron of the mineral with the siliceous matters contained in the ore and the fluxes added. 3. Sulphurous sulphur, more or less mixed with volatile compounds of lead, zinc, and arsenic.—4. Sulphurous gases. The process almost entirely obviates the necessity for using carbonaceous fuel, at least as far as the production of a regulus is concerned. The localities in which smelting operations may be advantageously carried on are thus greatly multiplied. Rich copper ores

containing 10 per cent., and even 12 per cent. of copper, exist in South America and other parts of the world, but are not at present capable of economic treatment, owing to the difficulty of obtaining a sufficient supply of cheap fuel. The chief demand for fuel in Mr. Holloway's process is for producing the steam for working the blast engines, but as water power will also serve for this purpose, the chief difficulty of applying the process to the treatment of ores in mountainous districts, where fuel is scarce, is in a fair way to be overcome.

The CHAIRMAN, in proposing a vote of thanks to Mr. Allen for his admirable paper, invited discussion, and spoke of the importance of the Holloway process, expressing the belief that it would greatly economise the production of copper ore. Mr. H. S. BELL, who seconded the motion, referred to the recent experiments, and said the failures were only of a mechanical nature, and there could be no doubt that the process had been successful scientifically. He thought there might be a fifth product—a species, consisting of nickel, arsenic, and cobalt.

Mr. T. BLAIR affirmed that all intelligent chemists, metallurgists, and mining engineers in the country had received the process with the utmost favour, but the old school of rule of thumb copper smelters had just done the reverse—either damned it with faint praise or thrown cold water upon it altogether; yet, as a practical man, he did not anticipate any difficulty whatever in carrying out the process, which they owed to the energy and perseverance of Mr. Holloway, and which had brought out new facts in chemistry.—Mr. PAPINEAU, who spoke more particularly on the practical operation of the process, said that the fact of sufficient heat and fluidity being obtained was evident to all who had seen the experiments, and that consequently the obtaining of a complete separation of regulus from slag was simply a matter of employing suitable plant. Arrangements would soon be made for the erection of a special plant, when no doubt very successful results would be obtained.—Mr. GALBRAITH also referred to the great benefits likely to accrue from the adoption of the process; and after the motion had been carried Mr. ALLEN suitably replied.

It should be added that, in illustration of the paper, Mr. Allen passed a stream of oxygen through pyrites contained in a heated glass tube. It burned with the greatest production of heat, and quantities of yellow sulphur passed off, being collected in a condensing apparatus. Although a large quantity of sulphurous gases was produced, Mr. Allen avoided the production of the least stench in the room by passing them into a large bottle of charcoal, which absorbed them completely. This mode of dealing with the gases is an idea of Mr. Allen's own. He also described some successful experiments he had made on antimony ores, and some also made by M. Pourcel, of the Terre Noire Iron Company, reported in the proceedings of a recent meeting of the Société des Ingénieurs Civils de Paris.

## Mining Correspondence.

## BRITISH MINES.

ABERLYNN.—J. Roberts, June 4: The blende on the large lode at No. 2 is looking well on the hanging side, and also on the heading in the forebrest, but the middle of the lode is not quite as good as it has been sometimes. We have been taking down the lode on the shale, which looks very well, and will produce from 2 to 3 tons of blende per fathom. We are getting on very well with the clearing of the deep adit north, which has been crushed in, but it seems to be better now before us. I hope that we shall be able to complete the drum next week; the framework is already fixed and loaded ready to put the axle on. We have a great many tons of blende ready to send down, and we are ready to sample the moment we can get the stuff away. The machinery works well.

ASSHETON.—Joseph Garland: The clearing of the 10 at Lindow's is proceeding regularly; the level has been cleared and secured 4½ fms. north of the cross-cut. So far the level has been found to be broken down and full of stuff, our progress is not, therefore, so rapid as could be desired. The 50, east of boundary shaft, was driven last month 2 fms. 3 ft. 3 in. The lode which was disturbed by a slide is becoming more regular in its bearing, and more normal in its character; it is now composed of quartz, carbonate of lime, and copper ore. The driving of this level has been suspended for the present. A small stope is being put over the bottom of the 20 to drain off the water from the bottom of Gundry's shaft. The tribute pitches below the adit and the 8 fm. level are yielding the usual quantities of ore.

BETTS-Y COED.—H. T. Haley, June 4: The engine, with hauling gear attached, is working well, and the men are making good progress in clearing the deep adit level. As soon as this level is clear we shall resume the driving of the east, where the lode is looking very promising. The lode by the pulley shaft in the shallow adit is worth 20 cwt. of lead ore per fathom. In the 20 fm. level, north branch, the lode is very compact, and yielding 30 cwt. of lead per fathom. We are getting some lead to pile, but the weather continues very dry, and surface water is very low.

BLAEN CAELAN.—Jonathan Pell, June 5: This week we have an abundant supply of water, and all is going on well. Our machinery has got into thoroughly good working order underground. The plat has been finished in the 30, and men have been cutting down the lode behind those driving the 30 east; all seen confirms my value of the lode (30c. per fathom). This lode continues very hard, so that men are earning little wages, and our progress this month has not been quite 3 fms. forward. We have about 8 fms. more to drive to communicate with the level from winze.

BLUE HILLS.—S. Bennetts, P. Vian, May 31: The lode in the 30 east end is worth 4½ c. per fathom, and of a very promising appearance, with good stones of copper in the surrounding capels, which indicates a more productive lode near at hand. The stopes in the back of this level are not so productive as they were some time since. The sinking of the shaft below this level is just commenced, and in a short time we hope to have another level opening out below, which will enable us to materially increase the returns.

BODRIS.—H. J. O'Connell, June 4: In the rise in the back of the 60 the ore bearing part of the lode maintains its size, and is nicely mixed with lead ore for the full length of the rise—looking more kindly to-day than for some time. This new shaft sinking from the surface is now in dark limestone, mixed with clay, wherein we find small cubes of lead ore; we have not as yet cut the lode here, but I believe we are drawing very near to it. There is no change in the 60 east on Maes-y-pwll lode, or in the 45 on middle lode, calling for any remark to-day.

BWLOH UNITED.—N. Bray, May 31: The old pumping-wheel continued to work with the supply of water we had, so as to keep the mine drained to within a few fathoms of the 90 until yesterday, when it entirely gave out, and to repair it would be a great waste of time and money, and especially as we had contracted for a first class 50 by 4 ft. new wheel, to be ready to work within six weeks from this time. Under these circumstances I am glad the directors have adopted my suggestion as to the necessity for a new wheel, as it turns out it is not ordered too soon. Good progress is being made in the rise and winze, and had it not been for the water rising the communication between the 60 and 70 would have been made in about three weeks. I have arranged for the men to get what materials are required for taking the old wheel out and erecting the new.

CLEMMYNN.—J. Roberts, W. Sandoe, June 4: The bob on the top of the engine-shaft is now completed, and we have turned to the fixing of the rods. In order to prevent the water from the wheel getting into the road-side shaft we have been clearing an old lobby that had crushed in, which formerly took the water across the turnpike road. It appears to us that this lobby was choked at the time that the road-side shaft was last worked, and the influx of water was chiefly on this account.

CWMYSTWTH.—June 4: Since the date of our last report Gill's lower level, west of No. 1 winze, on the new lode, has been extended 4 fms. In a lode 2 ft. wide, we have 2½ tons of lead ore per fathom; in the last 2 fms. driven the lode has improved from 1½ ton to 2½ tons of lead ore per fathom, and equally as good in the bottom of the level; this looks encouraging for the 15 coming forth under, and also proves that our run of ore ground continues in depth. No. 2 winze has been sunk to the required depth (and about 4 ft. below for a fork) for Gill's lower level, and the levels set to drive east and west for the same by nine men, at 8 ft. per fathom, and to draw their stuff and water; the lode in the end is 3 ft. wide, composed of a little lead and blende, but not of sufficient quantities to value; the main part of the lode or north part will be intersected as we drive westward, and will be cut through to full width, where we hope to have an improvement in the lode. The 15 cross cut, north at Fugh's engine-shaft, has been rather tighter for driving in the past week, and a small branch has been crossed carrying a little lead, blende, and spar; we have a pair of men putting in air-pipes from the main level to the end of the cross cut to improve the ventilation. In Gill's cross-cut driving north we are still meeting with patches of lodestuff and water; therefore, it is necessary we should drive a little further to prove what is still before us. All our stopes maintain their value as reported in our last setting report—average produce 17 cwt. of lead ore per fathom. We still have a good lode in the pitch in the 15, east of Kingside shaft, on Kingside lode and improvement, worth 1 tons of lead ore per fathom, and still continues westward, north of the main level. The other pitches are as previously reported. All our machinery is in good working order, and in full work, with a good supply of water, and we have been having some very fine showers, which have very nearly filled our ponds. Samples of 45 tons of lead ore were sent out yesterday, for sale on the 17th inst.

DE BROKE.—J. Phillips, June 4: The lode in the 5½, driving east of Wilson's shaft, is 4½ ft. wide, and yielding about 4 tons of lead ore per fathom, and improved generally. The stopes throughout the mine continue to open out, and fairly give a special change to report at this time, and the same remark applies to the tribute workings. The water supply continues good, and the dressing and other machinery in full activity.

D'ERESBY CONSOLS.—J. Roberts, W. Sandoe, June 4: The ground in the end 'driving towards Cobler's lode is still very hard, as it has been for two or three weeks past, and in consequence the progress is not so rapid as it had been. We expect that we have 3 or 4 fathoms more to drive to intersect the lode, but of course the exact distance cannot be ascertained, as we do not know how deep the dip lies between this point, and where the old men left off.

D'ERESBY MOUNTAIN.—J. Roberts, W. Sandoe, June 4: At the No. 1 lode is large, and producing more blende, and some spots of lead. At the No. 2 adit we have been making a road to bring back the stuff to throw it through the rise to the No. 3, so as to be able to tram it out to the floor at that level, and shall complete it in two days more. The stope at the bottom of this level is yielding good leadstuff. At the stope at No. 4 on the Gorse lode there is no change. The stope on the Hafna lode is looking very well—quite as good as we could have expected in so short a time. We are daily expecting to communicate the Gorse shaft with the No. 5 adit. We are still very short of water for the engine.

D'ERWENT.—J. Morphet, June 3: Jeffries' Shaft—Middle Vein: In the back of the 93, east of the shaft, we have four stopes, employing 18 men, the respective value being 16, 15, 15, and 15 cwt. of ore per fathom; average width of the vein 5½ ft. Over the 93, west of the shaft, five stopes, in which 20 men are engaged, are in operation, whose yield is 15, 12, 15, 14, and 12 cwt. of ore p. r. m. respectively; average width of vein 4 ft.—Sun Vein: The stope in the back of the 70, east of shaft, is working by four men; vein 3 ft. wide, and yields 16 cwt. ore per fathom.—Westgarth's Shaft—Middle Vein: In the 20 fm. level, 100 fms. of the shaft, six men are cutting side, which is yielding 24 cwt. ore per cubic fathom. In the 87, east of shaft, six men are also cutting sides in the same level; ground worth 24 cwt. of ore per cubic fathom. The stope over this level, 72 fathoms east of the shaft, is 4 ft. wide, and produces 24 cwt. of ore per fathom. The sides in this level, 50 fathoms east of the shaft, and working by six men, are yielding 15 cwt. of ore per cubic fathom. The bargain rising and stopping in the back, 45 fathoms east of shaft, set to six men, yield 14 cwt. of ore per fathom; vein 4 ft. wide. The 74 fm. level, 205 fathoms west of Westgarth's, on the middle vein, is showing more strength of vein, which at the bottom of the high coal sill shows spots of ore. The pumping is going very steadily, and the mine clear of water that accumulated during the repairs to the shaft.

DEVON GREAT CONSOLS.—Isaac Richards, June 5: Wheel Emma, Inclined Shaft: In the 187 east, east of Friend's cross cut, the lode—part carrying 5 ft. wide—is composed of capel, quartz, fluor, prlan, and mudi, and some copper ore of good quality.—New Shaft, New South Lode: In the 205 east and west the lode—2 ft. being carried—is composed of capel, quartz, fluor, and a little of both mudi and copper ore. In the 190 east the lode, 4½ ft. being carried, is worth 5 tons of copper ore, or 18½, and 14 tons of mudi per fathom. In Knott's winze in the bottom of the 190 east the lode, 5 ft. of which is being carried, is composed of very fine capel and quartz, and a small quantity of copper ore, and worth for length of winze—9 ft.—10 tons of mudi per fathom. In the 190 west the lode—part carrying 5 ft. wide—is composed of very fine capel, quartz, prlan, peach, copper ore worth 2 tons, or 6½, and 5 tons of mudi per fathom. In Floyd's winze in the bottom of the 175 east the lode—4 ft. being carried—is worth for length of winze—9 ft.—4 tons of copper ore, or 12½, and 5 tons of mudi per fathom. In the 175 west the lode is 3 ft. wide, and worth 3 tons of copper ore, or 10½, and 3 tons mudi per fathom. In Hockaday's rise in the back of the 175 west rising is being carried by the side of the lode, in the 175 east driving is being carried by the side of the lode for more speedy progress. In Doney's winze in the bottom of the 130 east sinking is being continued by the side of the lode in favourable ground for progress. In the half-way shaft, now down about 15½ fms. below the 160, the ground is favourable, and good progress in sinking is being made. We sampled on Friday last 848 tons of copper ore, for sale on June 19.

EAST CRAYVEN MOOR.—David Williams, June 5: The vein in the 64, east of new shaft, is rather disordered this week by cross joints and feeders running out of the same to the north side of the level; but, judging from the long runs of ore ground going down in the soles of the 42, and in advance of this end, I consider the change is only temporary, and when clear of their influence the vein will again become large, and resume its former value. A stope in the back of the level, in a vein 5 ft. wide, is worth 4 tons of lead ore per fathom. In the 54, west of shaft, the vein is 4 ft. wide, and worth 1 ton of lead ore per fathom. The 30 west has been extended upon the main lode 37 fms. 2 ft.; driven during the month 8 fms. The cross-cut south to the parallel veins from the 42, east of shaft, is in 40 fms. and is within a short distance of reaching the junction of three veins, and I entertain a very favourable opinion that a good discovery of ore will be met with at that point, inasmuch as each vein separately produced rich ore in the surface excavations. The 56, upon Hardgate end vein, has been extended 95 fms. 3 ft. west of shaft, and is still in hard ground, referred to in my last; a rise behind the end, by two men, in a vein 3 ft. wide, and producing saving work for dressing. On surface good progress is being made in cutting foundations for the new winding-engine, and raising and preparing large blocks of stone for the same and pumping connections.

EAST DARREN.—June 4: In the 104 cross-cut south, opposite Taylor's shaft.



the ground is easier for driving, showing at time spots of lead. In the 92 east and west of cross-cut, on south lode, the lode is from 2 to 3 ft. wide, rather soft, yielding occasionally stones of lead ore, but not sufficient to value. In 92, 130 fms. east of Taylor's shaft, a trial level is being started on a north branch west from a winze, and as far as cut into the lode is 8 ft. wide, containing a good mixture of lead ore, worth 15 cts. per fathom, and looks promising for further improvement. The winze sinking under the 80 east of cross-cut, on junction, is suspended, owing to having communicated to old workings in the roof of the 92 fm. level under. In the 81 cross-cut, on south lode, the lode is 4 ft. wide, yielding under. In the roof saving work for dressing, while along the sole of the level the lode looks well, yielding 1½ ton of lead ore per fathom. The stopes and pitches in the mine continue to yield fair quantities of lead ore. At surface the masons are making good progress with the building of new wheel-pit. The carpenters at present engaged in making new angle-bob for connecting the line of rods. The drawing and dressing are being pushed forward with a good supply of water, and we sampled yesterday (the 3rd inst.) 45 tons of good quality silver-lead ore.

**EAST LOVELL.**—June 5: The lode in the shaft at Severn is producing more tin than before; the south part of the lode is 18 in. wide, and yielding good stuff for the stamps; we seem to be approaching a good discovery.

**EAST ROMAN GRAVELS.**—A. Waters, June 5: The boundary engine-shaft is now down 4 fathoms below the 86. The lode in the 86, south of this shaft, is 5 ft. wide, worth 12 cts. per fathom. The lode in the 75, south of shaft, is 1½ ft. wide, yielding good stones of lead ore. No. 1 pitch, in the back of this level south, is worth 1½ ton per fathom. No. 2 pitch, in the back of ditto south, ¾ ton per fathom. No. 3 pitch, in back of ditto south, ¾ ton per fathom. The pitch in the bottom of the 50, south of shaft, is worth 10 cts. per fathom. The pitch in the bottom of the 50, north of shaft, is worth 1½ ton per fathom. The pitch in the back of this level south is worth 12 cts. per fathom. The pitch in the bottom of the 46 north is worth 12 cts. per fathom. The pitch in the bottom of the 30 south is worth ¾ ton per fathom. Our usual sampling of 30 tons of lead ore will take place on Thursday next.

**EAST WHEAL LOVELL.**—R. Quantrell, June 4: There is no alteration in the south shaft since my last report. The lode in the shaft at Severn maintains its size and promising appearance, and is producing more tin than it was. The south part of the lode for about 18 in. wide is good stamping work.

**GAYTON COPPER.**—G. Rowe, G. Rowe, May 31: There is no particular change in any part of operations since the report given for the general meeting on Thursday last.

**GLENROY.**—R. Rowe, June 3: There is more quartz again in the lode, mixed with blende, and an increase of water in the shaft. We have put on another pump, and shall have the shaft deep enough with this to drive out new levels by the end of next week. As the shaft has been going down between two distinct runs of ore ground—one north and the other south of shaft—the new levels, at an additional depth of 40 fms., will be of considerable interest, and throw great light upon the mine; the levels will be pushed out with all speed on the course of the lode.

**GOGINAN.**—June 4: The lode in the pitch below the 130, 10 fathoms west of western shaft, is 10 ft. wide, yielding at present 16 cts. of ore per fathom. The lode in the pitch over the 100, 40 fathoms west of Taylor's shaft, yields 16 cts. of ore per fathom. In the pitch over the 80, 10 fathoms west of Gilbertson's shaft, the lode is worth 12 cts. of ore per fathom. The dressing of the halvas is going on regularly, and we now have a good supply of water, the late rains having risen the brooks, and we are getting our reservoirs filled up as much as possible. We sampled 24 tons of good quality silver-lead ore yesterday, for sale on the 17th inst. The machinery is in good working order.

**GREEN HURTH.**—Wm. Vipond, May 27: The 30 north and south, on No. 1 cross vein, is set to 12 men, to drive at 98s. per fathom; the level to be 6 ft. 6 in. high by 4 ft. wide, square, timbered, and the work sent to surface. Driven last month 10 fms. 3 ft. The new ramp top is forming out very well, but owing to its large size it will be a week or two before we have all ready to begin sinking. We have finished the delivery of the 18th wagon of ore to-day, containing 7 tons 6 cwt. of total market value. The lode in the 100, 10 fms. west of the stock of ore dressed and undressed at 36 tons.—(P. S. Wednesday Morning: There is no change in the north end of the 30 yet; yielding about 5 tons of ore per fathom. The south end has improved this week, and is now yielding 5 tons of ore per fathom.

**HERODSFOOT.**—P. Temby, June 5: The 205 end south has a little improved, and is again worth 18 cts. of lead ore per fathom. The same level north is without change. In the 190 north the part carrying is worth 15 cts. of lead ore per fathom. The lode altogether is 8 ft. wide, and I think the hard run of capel will soon disappear, and the lode will be good in the end. The lode in the 100, 10 fms. west of the stock of ore dressed and undressed at 36 tons.—(P. S. Wednesday Morning: There is no change in the north end of the 30 yet; yielding about 5 tons of ore per fathom. The south end has improved this week, and is now yielding 5 tons of ore per fathom.

**LADYWELL.**—Arthur Waters, June 3: The 30 cross cut west, towards the lode, is driven about 6 ft., and we hope to reach the object some time next week. We have set the 32, north of Webster's winze, to five men, at 2s. per ton of stuff, to be delivered at the shaft. No change in the 32 south. The winze below the 16 south, close to the end, is set to four men, at 8s. per fathom; the lode is worth 2 tons per fathom. The lode in the back of this level, by four men, at 70s. per fm.; worth 1 ton per fathom.

**MARKE VALLEY.**—William George, James Stenlake, May 30: Setting Report: To continue the 90 west, on Rosedown lode, by six men, as per bargain uncompleted; the lode here is still disordered, being intermixed with capel, spar, and occasional good patches of ore; the underlie is regular, and there is a good foot-wall, but the present rate of driving is not equal to our expectations when the bargain was set. To stop the south part of Rosedown lode, below the 80, by four men, at 6s., yielding 5 tons of ore per fathom. To strip down the north side of the lode in bottom of the 50, by six men, which continues to yield from 4 to 5 tons per fathom. To stop the back of the 50, by four men, at 2s. 15s., yielding 2½ tons per fathom. To stop the bottom of the 40, by four men, at 4s. 5s., yielding 3 tons. Two stopes in back of the 40, by four men in each—No. 1 at 2s. 15s., yielding 3 tons, and No. 2 at 3s., yielding 2½ tons of ore per fathom. To stop the back of the 20, by four men, at 4s., yielding 4½ tons of ore per fathom. To drive the 10 west, by four men, at 9s. per fathom; the lode is from 4 to 5 ft. wide, composed of gossan, with spots of ore and muddle. To stop the back of this level, by two men, at 3s., yielding 2 tons of ore per fathom. To drive the shallow level west from the rise in back of this level, by two men, at 3s. 10s.; the lode is 2 ft. wide, yielding a little ore, but at present not to value. We have also set 11 pitches in different parts of the mine, at tributes varying from 10s. 6d. to 13s. 4d. in 11.

**MELLANEAR.**—John Gilbert, June 4: The lode in the 30, west of Gundry's shaft, is 1½ ft. wide, and worth ¾ ton of ore per fathom. The lode in the rise in the back of this level is 1 ft. wide, and worth 1 ton of ore per fathom. The lode in the 40, west of shaft, is 1 ft. wide, and producing some good stones of ore, but not sufficient to value. The lode in the 60, west of shaft, on the south-east part, is 4 ft. wide, and worth 2½ tons of ore per fathom. The lode in the rise in the bottom of this level is 4 ft. wide, and worth fully 2½ tons of ore per fathom, and the ground is a little improved for sinking. The lode in the 80, west of shaft, on the north part, is 1½ ft. wide, and worth 1 ton of ore per fathom. The lode in the 70, west of shaft, is 4 ft. wide, and worth 3 tons of ore per fathom. We have commenced about 20 fms. behind this end to cross-cut south for a short distance, with the object of discovering the south-east part of the lode that we have in the level above. The lode in the 80, west of shaft, is 3 ft. wide, and worth 1 ton of ore per fathom. The lode in the 90, west of shaft, is 5 ft. wide; the men are driving on the south part, which we consider the best, and which is worth 4 ft. wide, 3 tons of copper ore per fathom, and some good saving work for tin. The rise in the back of this level, west of shaft, is worth 3 tons of ore per fathom. The lode in the 100, east of shaft, is 4 ft. wide, and worth 1 ton of ore per fathom, and still producing a good deal of muddle. The rise in the back of this level, west of shaft, is up about 4 fms.; the lode is 4½ ft. wide, and worth 2 tons of ore per fathom. There is no change to notice in the ground in Gundry's shaft; it is rather harder than usual, but the men are making very fair progress.—Skip Shaft: The 70 cross-cut, south of shaft, is still easy for driving, and in about 5 fms. further it will have reached the distance that we estimated to meet with the lode. There is no change in the stopes or in any of the other bargains in this part of the mine.

**MINERAL CORPORATION OF GREAT BRITAIN.**—William Bennett, June 4: HAFNA AND HIGH HAFNA MINES: No lode has been taken down in the No. 3 adit since last week's report. We are driving on the shale part, so as to keep the blende and lead as clean as possible. The same remarks apply to the rise in the back of No. 3. At surface all the work is progressing satisfactorily, and we hope to have the buildings for the new water-wheel and crusher completed by the time named in my last report.

**MONYDD GORDDU.**—J. G. Green, June 4: I have nothing new to report since writing you on Monday. The 12 west has the same masterly appearance to-day, and, if anything, is a little improved in value. All other points are without change.

**MORFA DU.**—T. Mitchell, June 5: The various points of operation continue to look very well, and are yielding much as usual.

**NEW BROWN LODE.**—Thomas Egan, June 5: Setting Report: Middle Lode: Four men to continue the 75 end, west of Curt's cross-cut, at 11s. per fathom. Two men to further extend the 55 end, east of No. 2 shaft, at 6s. 10s. per fathom. Four men to further deepen the winze under this level, at 11s. per fathom. The foregoing prices includes tramming and hauling. During the present week the men at the different bargains are employed in tramming and hauling their stuff which accumulated in last month's breakings, consequently there is no change to notice since my report of last week.

**NORTH TREKERRY.**—Martin George, June 5: The lode in the 36, driving west of Doctor's engine shaft, is 4 ft. wide, composed of quartz, muddle, and copper ore, but not to value. The lode in the 24, driving west of engine-shaft, is 2½ ft. wide; this end is again improving, and now yields copper ore to save. The 12 driving on the south part of the lode, west of cross-course, is 5 ft. wide, and worth 1½ ton of copper ore per fathom. The lode in the winze sinking below the 12 is 3 ft. wide, and yields 1 ton of copper ore per fathom. The lode in the rise in the back of the shallow level is 3 ft. wide, and worth 2 tons of copper ore per fathom. This pitch is improving as we are getting west of the cross-course. The water still working in the western mine, and is now down 4 ft. below the bottom of the adit at the western engine-shaft. We shall sample a parcel of copper ore in a fortnight.

**PANDORA.**—H. Nottingham, June 4: I have nothing new to report from underground, the bargains being equal to last valuations given, and at surface we are making the usual progress with dressing, &c. I have sent out samples of 24 tons of lead and 20 tons of blende for five weeks dressing. I regret to say our water for drawing-wheel is getting very low in the big reservoir, and that unless we get some heavy rain we shall be short of water for this purpose. We have a moderate supply yet for crushing, &c. in the Bod Lake reservoir. The pumping and dressing machinery is all working well.

**PANT-Y-MWYN.**—T. Hughes, May 30: The lode in Griffith's shaft has traversed a splendid course of ore, leaving underneath about an average of 3 ft. of almost solid lead. The sleepers of the tramway along the 30 yard level have been laid for upwards of 100 yards, and I find the ore still continues, while leaving the reserves untouched. In the forebore of the level the lode is worth fully 6 tons of lead per fathom. We are stopping the ore between the 20 and 30 yard levels (below the day level), and are raising on an average 40 to 50 tons monthly from this point alone, at a cost of about 2s. 10s. per ton. We have commenced driving the 30 yard level, west of Griffith's shaft in order to intersect the rich course of ore that has been discovered in the 20 yards level west. We are also driving another cross-cut west of same shaft to cut the Great Chalcidic vein, which we must intersect within another month. The lode proved very productive eastward when worked by the late Mr. Cross, of Chester, and all in virgin ground to the extent of about a mile. It will be drained to the depth of 100 yards by the Great Day level, which is being cleared with the possible speed. We have carried the necessary pumps for that purpose from Rhdy-Mwyn in the future, therefore, we shall not be interrupted by the backwater, which retarded operations during

the winter months, causing a loss of above 12000, and, of course, prevented any dividend being declared. The Modlyn shaft has been sunk 40 yards below Day level, and we still continue sinking with ten men. We drove a cross-cut intersecting the lode at a distance of 20 yards below the Day level, and proving very rich, being 2 to 3 ft. in width. We are sinking the shaft plumb through the lode, so that we can erect our machinery perpendicular, and thus save a great expenditure of power. I propose driving levels at intervals of every 30 yards to intersect the lode, which appear to improve greatly in value. I may add, on account of the enormous quantity of ore now at surface, as like that broken underground, it will be incumbent to put up Green's machinery (now on the ground), as our present appliances are not adequate for increased output. When complete this machine will enable us to prepare a large number of tons monthly, which the mine is capable of producing. We sold 100 tons of lead within the last month, and will sell another 50 tons in course of next week, exclusive of about 6 tons of round ore. I court investigation from any shareholder in this great and valuable property, and shall be only too pleased if they will prove the foregoing statements by a personal inspection.

**PATRY COPPER CORPORATION.**—T. Mitchell, June 5: There is no change worthy of notice in either of the points here since the setting day. We have sampled the precipitate to-day—computed 50 tons.

**PATELEY BRIDGE.**—C. Williams, June 5: We have cleared all the work out from the 30 east on Monday last, and recommenced the driving on that day, and I am glad to say that the vein in the end is looking exceedingly promising, being fully 1 ft. in width, and consisting of all the elements that constitute great bodies of ore, and worth at present 15 cts. of lead ore per fathom; set for the month to four men, at 80s. per fathom. In the same vein under the 80 the pumping arrangements are nearly complete, and the ore course in the bottom, upon which operations will shortly be resumed, is worth fully 80s. per fathom. The stopes in the back over the 30 east is worth 15 cts. of lead ore per fathom; set for the month to four men, at 8s. 12s. 6d. per ton dressed ore. Fielding's vein in the 30 north-west is 5 ft. wide, and worth 20 cts. of rich lead ore per fathom; set for the month to six men, at 80s. per fathom. The Lumb vein in the 20 west is several fathoms in width; the part carried (8 ft.) is worth 1 ton of lead ore per fathom; set for the month to three men, at 6s. per ton dressed ore. Fielding's vein in the 20 north-west is 4 ft. in width, and worth 17 cts. of lead ore; set for the month to four men, at 8s. 12s. 6d. per ton dressed ore. Fielding's vein in the sump under the 20 north-west is 3 ft. wide, and worth 1 ton of lead ore per fathom; set for the month to six men, at 8s. per ton dressed ore. Dressing operations are proceeding favourably, and we shall sell 20 tons of pig-lead about the 16th inst.—New Machinery: I am glad to say we have laid the steam up to the new boiler to 100 lbs. to the square inch since 12 o'clock to-day, and the engineers are making preliminary arrangements for starting the new engine to-morrow.

**PENHALLS.**—S. Bennett, P. Vian, May 31: The lode in the 70 east end is 1½ ft. wide, and worth 6s. to 7s. per fathom. The stopes in the back of this level continue to be fairly productive, and worth 12s. to 15s. per fathom. In the western part of the mine the lode in the rise in the back of the 40 is worth 4s. per fathom. In the winze below the 30 east it is small, and not of much value. In the bottom of the 20 the lode has not yet been found north of the fault.

**PENRUTHAL.**—W. Polkinghorne, June 5: The 34, driving east of High-burrow shaft, is without change to notice, and is worth for tin 6s. per fathom. The lode in the 20, in the bottom of this level to four men, which is worth for tin 10s. per fathom. All the other bargains throughout the mine are much the same in value as for some time past.

**PRINCE OF WALES.**—John Andrews, May 29: Since your last general meeting operations have been carried on on a limited scale above the adit levels on the Wneal Gorge or silver lode. At the western shaft a small quantity of silver ore has been raised in the back of the 24 by the tributaries, at 13s. 4d. in 11, but after several months trial they gave it up, as they could not earn anything like fair wages. Since, the same party of tributaries have been raising muddle at Vigar's shaft on the Wneal Gorge, and the 13 cwt. silver ore has been raised muddle at Vigar's shaft, but as they could not earn fair wages they have given up the tributaries, and the mine is now idle; I, therefore, cannot recommend further operations to be carried on in this part of the mine, as I consider it has had a fair trial. With regard to the copper part of the set, I consider it to be a good speculation, and with efficient pumping machinery I believe would prove a success. The plant and machinery now on the mine are sound and in good working order, and the pumping engine is of sufficient power to keep the mine drained to the deepest point—90 fms. below surface—but not powerful enough to put the mine any deeper unless the deep adit was driven up to take the water out of the mine. The deep adit, which I am told, is driven 50 or 60 fms. north of Goodluck, and 60 fms. further driving would reach the copper lode, and would drain the mine down to about the 55 fm. level, leaving about 35 fms. from the deep adit to the bottom of the mine. If the deep adit were driven up to the copper lode it would take away the greatest half of the water we had to pump before the copper part of the mine was suspended, and by so doing the present pumping-engine would, in my opinion, be of sufficient power to put the mine 30 fms. deeper.

**RODMAN GRAVELS.**—Arthur Waters, June 3: We shall resume sinking the new engine-shaft below the 110 some time this week. The 110, north of this shaft, is in a strong lode, yielding stones of lead ore. The 110, north of ditto, is through the twitch, and now worth 1½ ton of lead ore per fathom. The 95 fm. level south is passing through a twitch; the lode at present is worth ¾ ton per fathom. The 80 south is worth 2 tons per fathom. The 65 south has improved this week, now worth 6 tons of lead ore per fathom. We have this week cut into a good lode in the 40 south, which is to-day worth 2½ tons per fathom. The stopes throughout the mine are yielding ore in quantities as for some time past. The masons are making fair progress in building house and loading for the new winding-engine.

**ROOKHOPE.**—T. Tonkin, June 5: Adit Level: The drive on the side vein is still very hard, and yields 12 cts. of ore per fathom. The stopes near Gin shaft are also hard and slow to work; they now produce 10 cts. of ore per fathom. In the 15 there is not much alteration in the stopes in the back, near Gin shaft; the ground is a little easier, and the yield of ore as usual—8 cts. per fathom. The stopes near the Low shaft are easy to work, and produce also 8 cts. of ore per fathom. The stopes on side vein, beneath the 25 fm. level, are not so good looking as last week, still they yield fair work now—about 15 cts. per fathom in the average produce. We will shortly be through with the rise from the 42 to near this point. The drive at the pump-sump is going forward at a better rate, and produces 10 cts. of ore per fathom. The stopes near Gin shaft, in back of the 42, are at present in harder ground, and the yield of ore a shade better; they now produce 9 cts. of ore per fathom. The stoping ground on the side vein, near Low shaft, looks a good deal better for ore, but is very hard, and progress is in consequence slow. A part of the ground will yield 20 cts. per fathom if appeared the machinery good work, or otherwise. Dressing operations are going forward as usual.

**SOUTH CAMBRIAN.**—A. Williams, June 4: The lode in the adit level driving east has for a few days since my last report fallen off in value, but I am glad to add that it is now again as productive as ever, and will yield fully 4 tons of blende ore per fathom. The lode in stripping down under shaft sunk on surface still continues to look well; its component parts are quartz, gossan, and blende ore of good quality.

**SOUTH CONDURROW.**—Wm. Rich, Wm. Williams, H. Abraham, June 4: The lode in the 30 end east, letting out water freely, and is worth 7s. per fm. The 40 end carries stones of tin. The 50 east is worth 12s. per fathom. The rise in the back of this level is worth 15s. per fathom. The rise in the back of the 50, east of Plantation shaft, is worth 20s. per fathom. The north lode, in the 50 west, is worth 7s. per fathom. The ground is easy for driving in the 50, north of Plantation shaft, and several branches have been met with. The 70 end west carries a little tin. The 70 end east is worth 8s. per fathom. The rise in the back of this level is worth 20s. per fathom. The 80 end, west of Plantation shaft, is worth 11s. per fathom. The 80, east of this shaft, is worth 7s. per fathom. The 80, east of King's, is worth 9s. per fathom. The stopes in the back of the 90 east is worth 25s. per fathom.

**SOUTH DAREN.**—Henry James, June 5: Bishop's shaft is 7 fms. 2 ft. below the 100; the lode is not stripped down. The 100, west from the shaft, is worth 2 tons of lead ore per fathom. The 100, east from the winze, is worth 1½ ton per fathom. The 100, west from the winze, is worth 2½ tons per fathom. The 90 end and all other points are without change since last week. Surface work going on regularly. The 45 tons of silver lead ore sold on the 30th ult. realised 608s. 12s. 6d., and 50 tons of copper ore, 25s. 6s., together 638s. 17s. 6d.

**SOUTH TOLCARN.**—W. Rich, J. Knowell, June 3: In the 36 end east we have a great increase of water; the level had previously been quite dry, but the water suddenly burst out before we had time to timber the ground. We cannot yet get into the end to see the cause of this influx of water. The level requires to be timbered several fathoms back from the end. We rather think the water is coming from a cross-course, but we shall push on towards the end as fast as possible. The rise in the back of the 36 east yields stones of copper ore.

**TAMAR.**—R. Goldworthy, June 5: The 37 south is driving, by four men, at 6s. per fathom. The 37 north is driving, by four men, to reach the productive ground. A tribute pitch in the back of this level, by two men, at 9s. per ton for silver-lead and 6s. per ton for floor-spar. A tribute pitch in the bottom of the 27 south, by three men, at 9s. per ton for silver-lead, and 9s. per ton for floor-spar. To clear and secure the 27 south, by two men, at 1s. per fathom. The south stopes is suspended while this work is being done. All other points are being pushed forward as fast as the nature of the work will allow.

**TANKERVILLE.**—Arthur Waters, June 5: The men are making very fair progress with the cross-cut west towards the great lode at the 20. We calculate reaching the lode very shortly. The various ends and stopes, &c., throughout the mine are yielding ore as per recent valuations.

**TEESDALE.**—May 29: A still further change has taken place in the west end forebore; there is much more vein and lead ore; it is now fully 5 ft. wide, and nothing like an east creek; we are either getting into a very wide belly or pocket, or else there is some intersection from the east side—I am inclined to think the latter. It never was half so strong before, and I think far richer than I have ever seen it; 3½ tons per fathom may safely be fixed as its present value. There is nothing particular to report from west end stopes. No. 1: the best parts of it are at the bottom and top. West end stopes. No. 2, is much more promising than at my last report; a rib of ore has set on close by the plate check, where it was nearly all sulphur before; this is the highest point we have reached going upwards, and is most favourable, seeing that the limestone cannot be very far off; it still remains uncommonly hard, and slow to move. Only two or three shots have been done in the north end east since the bargain; it is of a sugary nature, and easy work, and partly crushed with the old men's workings being so close above us; I believe the men will do well at their bargain of 30s. per bing. The dressing are getting on satisfactorily, though the house is getting rapidly reduced. We have something like 10 tons of lead ore ready dressed in the bin stand, and a considerable quantity in hand of chate, slime, and rough grinding. Since writing the above I have had further information that the west end forebore has improved very much more than when I saw it on Thursday.

**VAUGHAN.**—June 4: In the stopes over the 30, west of winze, on the south part of the lode, the lode is large, and maintains its average yield of 27 cts. of lead ore per fathom for the width of the lode, and as far as proved, is lengthening in going eastward, behind the piece of ground previously stoped away over this level. The drawing and dressing are proceeding regularly, with an ample supply of water.

**WEST ASHINGTON.**—Joseph Garland, June 4: There is no change to notice in the 40, west of boundary shaft; the ground is easy for driving, but the lode is still unproductive. The eastern, or No. 1, stopes has not improved since last reported on; the lode contains good stones of ore in places, and saving work very nearly throughout. The lode in the new, or No. 2, stopes has not yet been taken down, the men having been engaged in putting in a stall, &c.; the value of the lode shall be given in my next report. The lode in the 50 east, very small, and unproductive; the ground is favourable for driving. The pitches in the back of this

level maintain their value, and are yielding very good piles of lead ore. There are now three pitches working in the back of the 60, in one of which a very good branch of lead ore has come in during the past week. We are expecting a quantity of iron from Bristol in a few days, and on its arrival we shall commence with-out delay to prepare the work for faking out the water below the 60.

**WEST CRAVEN MOOR.**—D. Williams, June 5: Blackhill Lode: This level has been extended 25 fms. 3 ft. east of New Blackhill shaft; driven last month 5 fms. 3 ft. The lode is letting out water very freely, and the bottom of the new west and new east shafts are now quite dry. No. 2 stopes, in the back of this level, is in a vein worth 12 cts. of lead ore per fathom. No. 3 stopes, in the back of this level, is in a vein worth 15 cts. of lead ore per fathom.—New East Shaft: I have set a pair of men to resume sinking this shaft for a 30 fm. level.

**WEST PATELEY BRIDGE.**—D. Williams, June 5: Craven Cross Shaft: The 67 is extended north west of shaft 5 fms. 2 ft.; the vein in the present end is 4 ft. wide, composed of gossan, spar, and stones of ore, and promising for a speedy improvement as we approach the perpendicular of the ore, found going down in the soles of the level above. The same level south-east is extended 16 ft. from shaft in a vein 2 ft. wide, and producing saving work for dressing. We have to-day completed cutting flats in both ends of shaft, and the same men will now be available for rising and stoping in back of the levels. The 56 has been extended north-west of shaft 28 fms.; driven during the month 6 fms. 3 ft.; the vein in this drive for the last 10 fms. has produced 15 tons of lead ore, being an average of 30 cts. per fathom. The cross-cut north-east to the parallel veins has been extended 15 fms.; driven during the month 4 fms. 3 ft. The south-west cross-cut is in 5 fms. 5 ft.; driven during the month 4 fms. 5 ft. We are working Craven's rock-drill 15 hours per day in this end, and are pleased to say very satisfactory results are being obtained. The rate of boring being twice as fast as with hand labour.—No. 2 Shaft: The metal pitch in back of the 28, east of shaft, is worth 12 cts. of ore per fathom. In the driveage east from cross-cut, west of shaft, the vein is producing saving work for dressing. We have 30 tons of clean ore in the bin, and another 10 tons in course of dressing; being short of water we have not been able to grate this week.

**WEST WHEAL TOLGUS.**—June 5: The lode in the 155, west of Taylor's shaft, is 3 ft. wide, and yielding 1½ ton of copper ore per fathom. The lode in the 145, west of shaft, is 4 ft. wide, and yielding 1 ton of ore per fathom. The lode in No. 1 winze, in the bottom of this level, west of shaft, is 4 ft. wide, and yielding 4 tons of ore per fathom; this winze is now about 9 ft. in advance of the 155 end. The lode in No. 2 winze west of shaft, is 4 ft. wide, and still yielding 2 tons of ore per fathom. We shall have to suspend this winze for a short time in consequence of cutting some water, which will prevent the men from sinking. The lode in the 145, east of No. 1 cross-cut, is 2 ft. wide, and yielding ½ ton of ore per fathom. The lode in the 135, west of shaft, is 1 ft. wide, and yielding 1 ton of ore per fathom. The lode in the bottom of the 125, is 1 ft. wide, and yielding 1 ton of ore per fathom. The lode in the 135, and the men are put to sink No. 5 winze in the bottom of the 135, in a lode 2 ft. wide, and yielding a little saving work for copper ore. There is no change to notice in any of the stopes in this part of the mine since last report.—Richards' Shaft: The lode in the 95, west of shaft, is 3 ft. wide, and yielding good stones of ore. The lode in the 65, west of shaft, is 2 ft. wide, yielding a little ore, and looking more promising than for some time past.

**WEST YOR.**—S. Harris, June 5: During the past week we have driven the adit level east cross-cut 3 ft., and have intersected a cross-course which is about 15 cts. wide. We have not seen the lode to the east of it, but expect to find it in two or three days. I have this morning taken and assayed a sample of the lode west of cross-course that produced 14 lbs. of tin per ton of stuff. The lode close to the cross-course is not so foul with muddle as it was further back, but contains about the same quantity of tin.

**WHEAL CREBOR.**—John Andrews, June 3: The part of the lode we are carrying in the 120 east is looking more promising than for some weeks past, and now yields good stones of copper ore. The lode in the stopes in the back of the 120 is 4 ft. wide, and worth 8s. per fathom. The lode in the 108 east is 5 ft. wide, and worth 10s. per fathom. The lode in the winze sinking below the 108, 17 ft. wide, and worth 20s. per fathom. There is no change in the rise in the back of the 43 nor in the sinking of the new shaft.

**WHEAL GRENVILLE.**—T. Hodge, June 4: Good's shaft is below the 165 fm. level about 3 ft. on the south side of the flat lode. The 165 east end is producing low price tinstone. In the 165 west end the lode is looking more promising. In the 155 east end the lode has dropped back north; the part carried (2 ft.) is producing good work for tin. The stopes in back of the said level is worth 1½ ton per fathom. The winze sinking below the 140 is worth 8s. per fathom. The lode in the 140 east end is worth 8s. per fathom. No other change. The 150 end, driven by boring-machine, measured for four weeks, 9 fms. 3 ft. 6 in. The machine is working well.

**WHEAL RU-SELL.**—John Bray, June 5: The lode in the rise above the 25 is full 3 ft. wide, producing beautiful stones of ore, very promising. The eastern end not so good. No improvement in the end.

**WHEAL UNY.**—William Rich, Matthew Rogers, June 2: The rise in the back of the 172, towards the old engine-shaft, is progressing satisfactorily. The 160 end, west of the incline shaft, is worth 10s. per fathom. The lode in the 160, east of Gooding's, is better defined, and looks likely to improve. The winze below the 150 west is communicated with the 160, which has given good ventilation. The 130 west is worth 7s. per fathom. The 130 end, east of King's, is worth 7s. per fm.

#### AUSTRALIAN MINES.

**PORT PHILIP AND COLONIAL (Gold).**—April 15: Quantity of quartz crushed both on companies' and tributers' account for the month ending March 26 was 4073 tons: total gold obtained, 1524 ozs. 13 dwts. Receipts (including 1928s. 7d. obtained from tributers), 3408s. 12s. 2d.; payments (including 456s. 1s. paid for firewood and mine timber), 2335s. 19s. 3d.; profit, 1072s. 12s. 11d., which added to previous balance of 1469s. 6s. 5d. made an available balance of 2540s. 19s. 4d. Amount divided between the two companies was 1000s. The Port Phillip Company's proportion of which was 650s. The balance of 1536s. 19s. 4d. was carried forward to next month's account. Remittance, 600s. Telegram: Melbourne, May 30: Month ending May 21: Gold obtained from companies' quartz, 264 ozs.; gold obtained from tributers' quartz, 1144 ozs.; profit, 1004s. Remittance, 600s.

**ENGLISH AUSTRALIAN.**—The directors have received the following advices from Capt. Raisbeck, under date Fryerstown, April 14: "I have the honour to report progress since the 19th ult. We have extended the 420 ft. level south 11 ft. distance from shaft 438 ft. On the 22nd ult., as there was no improvement in the lode, the tributers' stopes looking very poor, also our funds getting low, I stopped the end of a time. Tributers have crushed 170 tons—result, 1 oz. 16 dwts. 10 gr. of gold. Three of the men worked a few days, and left on the 29th ult.; three were left, and two men have joined them since. In consequence of the men leaving the tributers have not made full time in driving the 320 ft. end south; they have extended this drive 18 ft.; there is a little quartz in the rise, but not payable. They have also driven 10 ft. north upon the lode from No. 1 end, 37 ft. above the 320 ft. level, opposite their south drive, the quartz decreasing, and very poor. The bulk of our quartz is formed by a succession of leaders one over the other upon the lode extending west—some of them as much as 20 ft. The principal payable work done by the tributers this month has been upon these leaders. In various places west of their old workings. I am sorry to inform you these runs of stone are getting smaller and poorer going north; it has not yielded so well as was expected. As Mr. Clark informed me we only had about 600 lb. in hand (we have about 300 lb. of muddle at the mine) you will see it depends upon the tributers working and getting gold sufficient to carry on the work; should they fail, we must stop. We have reduced the working expenses to a minimum, having only three men working upon the level at present."

**SCOTTISH AUSTRALIAN.**—The directors have advices from Sydney to April 15. The sales of coal from the Lambton Colliery for the month of March amounted to 17 93s. tons.

**YORKE PENINSULA.**—The directors have advices from the committee of inspection at Adelaide, with reports from the Kurilla Mine to April 14. The following are extracts from Capt. Anthony's report: "Hall's Shaft: At present, and indeed until the price of copper rises, nothing is being done towards further deepening this shaft. Under other circumstances I should be pushing it down with all possible speed. The lode is a good one, and has driven 42 fms. from the shaft, and has set a fresh contract of 36 fathoms, at 8s. 8s. per f



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## The Mining Market: Prices of Metals, Ores, &amp;c.

## METAL MARKET—LONDON, JUNE 7, 1879.

IRON.	£ s. d.	English, ingot, f.o.b.	£ s. d.
Fig. G.M., f.o.b., Clyde.	2 2 0	bars	66 0 0
Scotch, all No. 1.	2 4 0	refined	67 0 0
Bars, Welsh, f.o.b., Wales.	15 0 0	Australian (nom.)	65 0 0
in London.	2 6 0	Banca	67 0 0
Stafford.	6 8 0	Straits	67 0 0
in Tyne or Tees.	5 8 0		
Swedish, f.o.b., Sweden.	18 0 0		
in London.	15 0 0		
Sheets, f.o.b., Sweden.	10 0 0		
in London.	12 0 0		
Hoops, f.o.b., Sweden.	10 0 0		
in London.	12 0 0		
Half rods, f.o.b., Sweden.	15 0 0		
in London.	12 0 0		
STEEL.			
English, spring.	13 0 0		
cast.	10 0 0		
Swedish, f.o.b., Sweden.	13 0 0		
in London.	12 0 0		
LEAD.			
English, pig, common.	13 6 13		
in London.	13 6 13		
Spanish.	13 6 13		
NICKEL.			
Metal, per cwt.	18 0 0		
Ore, 10 per cent. per ton.	24 0 0		
QUICKSILVER.			
Flasks of 75 lbs., ware.	6 0 0		
SPELTER.			
English, Swansea.	14 5 0		
Sheet zinc.	19 10 0		

REMARKS.—The metal market shows little change, and owing to the Whitsuntide holidays at the early part of the week its progress has been somewhat checked, but trade has fallen to such a low depth of depression that a few days holiday now and then form but a very slight additional impediment to the general routine of business, transactions having for such a long time been so much contracted that it is without difficulty they can be carried through in a shorter space of time than six days per week. Therefore, if it not for the numerous losses which have been incurred, a few days recreation from the monotony of trade just now would be very appreciable, providing that fine and pleasant weather prevailed. Orders still continue limited and quotations low, and it is pretty evident that there are other much more serious interruptions to the trade than those brought about by holiday makers, and the heavy stocks clearly show that the continued over-production is the chief cause of the present depression that has taken place, and as the future course of the market will undoubtedly be regulated according to the extent of supplies, it is of the greatest consequence that they should be kept within moderate bounds.

However, there seems to be a possibility ere long of a slight diminution in the production of some metals, and it is to be hoped the reduced make may be sufficient to allow of the already superfluous stocks to work off, as higher prices cannot possibly be obtained until this is the case, and as consumers have for a long time past purchased very sparingly, it may fairly be expected that they would be induced to buy a little more freely upon limited supplies for a few months, as stocks would then begin to dwindle down to more reasonable figures, and this presents an opportunity for metals to recover part of their former value. With a sensible reduction in stocks speculators would only be too eager to commence operations, and instead of remaining inactive, as they have hitherto been doing, they would help to give animation to the markets, and facilitate a more speedy recovery; but at a period like the present speculation by itself is useless, and only ends in loss. Producers and importers must show and take a greater interest in the markets, and do their best to persevere and maintain them in their right and proper positions.

COPPER.—Since our last report quotations have become somewhat firmer, owing partly to the increased export demand to the East, which has in some measure been caused by the improved exchange, arising from the advance in the price of silver, and also from the announcement of moderate charters for the last fortnight of May, as well as from the war still raging on the West Coast of America, and which at the present stage it is quite impossible to say how it may terminate. The sympathies and best wishes of all honest people are unquestionably with Chili, but there is always such uncertainty and dangers in connection with war that although Chili appears to possess the strongest force on the seas, yet an accident might suddenly occur to deprive her of that advantage, and in the event of such a disaster the City of Valparaiso might be at the mercy of the Peruvian fleet, and an effective blockade of the Chilean ports would at once stop further supplies of copper, and in that case there would, of course, be a temporary cessation of charters. It is, therefore, not in the least surprising that merchants in Valparaiso should have been eager to charter for as much copper as they have available while shipments can be made with safety.

Previous to the last charters the quantities announced were excessive, and above the requirements of our market, but it must be understood that although these charters have rendered the statistics higher than ever before known, yet the copper is deposited here more for the purpose of safety than for immediate sale. The figures are large, they might almost be described as enormous, but too much importance must not be attached to them in the way of influencing future prices. They are a momentary drawback, but holders need not be unnecessarily nervous or alarmed if only producers will hereafter act with discretion in regulating supplies. There is ample room for an increase in the value of this metal, and if future supplies are kept limited, and the stock well controlled, an improvement in price may occur to the extent of 10s. to 20s. per ton. According to the statistics published on the 1st inst. the total stock in existence on that date was 58,448 tons, against 52,711 tons on May 1. This is very unsatisfactory, and would doubtless lead to lower prices, but it is not necessary to see the utter folly of overstocking the market, and that reduced production is the only way by which they can obtain higher prices. The augmentation from Chili has been accounted for above, which does not proceed from increased production, and no increase in production is anticipated from Australia, and if the imports of Spanish pyrites and precipitate are kept moderate the market may soon be considerably improved.

IRON.—Business in this metal shows no change whatever, and the demand keeps very limited, and prices unaltered, although the tendency is decidedly in buyers' favour; but at present they seem to be in no hurry to take advantage of the low rates now offering. The various mills, consequently, continue to suffer very much from want of orders, and the distress caused through so many men being out of employment is, consequently, rather on the increase than on the decrease. Owing to the scarcity of contracts makers have been only too eager to prolong the holidays to a longer time than they would otherwise have done. The attendance on a large 24 Middleborough, last Tuesday, was very thin, from this cause, and there were but few transactions carried through, and sellers, in order to effect sales, were obliged to accept lower rates, though it is reported that some of the first class houses were asking rather above last week's figures. But the average quotation for No. 3 was 5s. 6d., and No. 4 4s. 6d., with merchants offering their few orders at 6d. per ton below these quotations. On account of the reduced rate of coke, and also to its having become so much more plentiful, it is fully expected that within a few days most, if not all, the furnaces that have been blown out in this district will be re-lighted. Shipments have been fairly maintained, except those to Scotland, which, as may be seen by statement at foot, compare unfavourably with those for the same period of last year. They are also nearly 350 tons less than the exports for the previous week.

The manufactured trade remains quiet, the chief demand being for general merchant iron. Plate-makers are said to be receiving rather more orders, and the future prospect of these manufactures is not quite so unsatisfactory as it was a few weeks back. Ship plates are quoted at an average of about 6s. 2s. 6d., and angles and bars at 5s. per ton. The activity which Messrs. Bolckow, Vaughan, and Co. have received at their steelworks is encouraging other manufacturers to produce steel, and it is stated that the Darlington Iron Company have already begun to prepare their works for the manufacture of this article, and it is expected that other companies will ere long follow suit, and it is not at all improbable but that some of the firms who have fallen in the North of England will try their success in making steel in place of iron. From South Wales the reports continue encouraging, and there is little or no demand for railway iron. One or two extra furnaces have been put in blast, though the orders that are given out are so limited that there is little or no need for them.

There are rather more enquiries for bars, but those for pig are very few. Clearances continue small, and the colonial requirements are most limited. A slight improvement is reported to have been perceptible at Sheffield, and, as consumers are entertaining the belief that prices have receded as low as they are likely to, they do not hesitate so much in giving out their orders. Best Staffordshire bars are quoted at 7s. 10s., but inferior qualities are quoted much under this price. There is no change on the Birmingham markets, sellers continuing to quote at last week's figures, and they are receiving very few orders. At Leeds there is no improvement in the demand, either for the better or inferior descriptions of iron, and sellers make no alteration in their quotations.

It is reported that manufacturers are only too glad to prolong their holidays in this district, as they can find such little work for their men. It is said that there is a little more animation in the cut-nail trade, but prices are too low to allow of any profitable returns from the various transactions. The warrant market at Glasgow has been on the decline, the opening price on Monday having been 42s.

but the cash price soon receded to 41s. 10s. 4d., and from thence to 41s. 6d.; but a rally set in, and 41s. 7s. 4d. was again paid, and our market now close at 42s. cash.

For the week ending May 31, 1879.	Tons	15,434
For the week ending June 1, 1879.	Tons	7,393
Increase		8,072
Total increase for 1879		54,867
Imports of Middleborough pig-iron into Grangemouth:—		
For the week ending June 1, 1879	Tons	7,575
For the week ending May 31, 1879	Tons	3,000
Increase		4,575
Total decrease for 1879		29,441

In blast May 31, 1879 89  
In blast June 1, 1879 91  
TIN.—During the past week this market has remained quiet, and prices have kept tolerably steady. A limited number of transactions for cash parcels have taken place at 66s. 15s. to 67s. per ton, and a few orders for arrival have been executed at somewhat under these figures, but the market closes rather firmer. The statistics published at the end of last month are rather more favourable than their immediate predecessors, for they not only show a reduction of 533 tons in the total stock (the quantity on the 31st ult. being 17,431 tons, against 17,963 tons on April 30) but they also show that shipments from the Straits and Australia during May last were not half what they were in April, the quantity being only 210 tons against 475 tons from the former, and 38 tons against 670 tons from the latter. These statistics may, therefore, be reckoned more satisfactory than the last, and it is to be hoped that the next will show the reduction in the supplies to be quite as good as these, if not better.

LEAD.—The market for this metal remains steady, and prices are rather easier.

SPELTER.—There is no improvement in the demand, and sales of Silvan continue to be effected at 14s. 10s. per ton.

STEEL.—This market shows no alteration either in price or demand.

TIN-PLATES.—At a meeting of the manufacturers at Swansea last Wednesday it was wisely decided to continue the reduced make of tin-plates until Dec. 31 next.

QUICKSILVER.—Business in this article has been entirely suspended in consequence of the death of Baron Lionel de Rothschild.

MESSRS. BROOKER, DORE, AND CO.—TIN PLATES: The demand is scarcely so good as it was, and prices are somewhat easier.—GALVANISED IRON: There is a steadier demand for good makes, and not so much underselling as was common a few weeks ago.—LEAD: Prices show very little alteration upon those of last month. The market closes firm.—HARDWARE: Several further alterations have been made in prices, all in favour of buyers; amongst them we may mention a reduction of 3d. per cwt. on "Mitre" cut nails, and 9d. to 1s. on wrought nails, and an increase of 10 per cent. in the discount off Anglo-American stamped tin ware. It was noticed that we have withdrawn the special note made in last circular as to our future inability to deliver consignments under 2 tons free on board. The pressure brought to bear upon the railway companies has induced them to withdraw from the position they had taken up, so that we can now quote free on board as before without any stipulation as to quantity.

MESSRS. FRY, JAMES, AND CO.—COPPER continues to be supplied in increased quantities, and buyers act with great caution. Generally speaking the transactions are on a small scale, but Australian has been in considerable demand for export to the East, causing this description to maintain prices steadily, whilst all other kinds have receded slightly in value.—IRON: Without material change.—TIN: Has been without any very noticeable feature, the fluctuations having been slight, but shows a rather firmer tone in the last day or two.—SPELTER: Is quoted slightly lower.—LEAD continues quiet, with turn of prices rather in buyer's favour.—TIN PLATES are quiet, and somewhat lower in prices. At a meeting of makers yesterday it was determined to continue the short time working initiated about six months ago.

MESSRS. VIVIAN, YOUNGER, AND BOND—COPPER: Chili bars showed little change during the first fortnight, and transactions were unimportant, at about 58s. 15s. for g.o.b.s. The supplies outside of Chilean production, more especially of Spanish precipitate, form a factor of increasing importance. The heavy shipments from the coast of Chile, probably for security's sake during the war with Peru, have produced very unfavourable statistics, but as prices have not given way more than 10s. per ton, though the cost of bars to lay down in Liverpool does not exceed 55s. per ton by the last advices to the 30th ult. at Valparaiso. The Indian demand for manufactured has been considerable. The charters of copper produce advised by cablegram from Valparaiso represent 5700 tons in fine copper for the month of May.—TIN: Prices of fine foreign fell from 68s. 6d. to 66s., and fluctuated but slightly until the approach of the Dutch sale, when 65s. 9d. was temporarily the quotation, after which the price receded to 66s. The market is slightly firmer at the close, and if the deliveries represent consumption, the shipments from Australia and the East are not excessive. There have, however, been several important discrepancies between recent cable advices and the actual shipments (and also between the different advices themselves), all pointing to an excess of shipments over estimates. The May shipments are estimated at 250 tons from the Straits and 60 tons from Australia.—LEAD: Dull throughout the month, at 5s. per ton decline to 13s. 15s. for English, and 13s. 10s. for soft Spanish. Silver-lead, 13s. to 13s. 7d. 6d.

MESSRS. PILEY AND ABELL—GOLD: The transactions at the Bank nearly balance each other, there having been an influx of 50,000l.—sovereigns—from Australia, and a withdrawal of 53,000l. for the Cape. The demand for bars for export has not been very active, but the small arrival mentioned by us has been taken for Holland. Arrivals of gold coin may now be looked for from America, 50,000l. having been shipped from New York yesterday. We have received 9400l. from the Brazil, and the Don takes 6740l. to the West Indies.—SILVER: The market for silver has continued to improve since our last, the price having risen daily until yesterday, when 52s. 4d. was reached; after such buoyancy a little reaction has been experienced to day, and although the amounts offered for immediate sale are not large, we can only quote 52s. 4d. to 52s. 4d. per ounce as the nearest rate. Business to some extent has been done during the week for India, China, and the Continent. The arrivals have been about 41,540l. from America and 12,000l. from the Continent. The steamer leaving to-day takes 4,000l. in bars and coin to Bombay.

THE MINING SHARE MARKET, which continues in a dull and depressed condition, has been further influenced this week by the Whitsuntide holidays, and for the most part the quotations given are merely nominal. The mines chiefly dealt in have been Roman Gravel, Wheal Crebor, Wheal Peavor, South Condurrow, South Frances, Wheal Grenville, and a few others.

TIN.—There is no change in this metal, and business in mines is restricted to a very few, such as South Condurrow, South Frances, Wheal Peavor, &c. Carn Brea are quoted 25s. to 27s.; Dolcoath, 25s. to 27s.; Tincroft, 9s. to 9s. 4d.; Wheal Grenville, 4s. to 4s. 4d.; the accounts for the meeting on the 12th show cash in hand 2008s. 5s. 9d., calls unpaid 244s. 10s. 4d.; against which they owe due to the lord. 917s. 12s. 9d.; Camborne Trading Company, 1510s. 19s. 5s. 1d.; total, 2428s. 12s. 2d. The costs are charged up to April 19. The costs and returns for the three months ending April 19 show costs, 2256s. 1s. 3d.; tin sold, 1886s. 7s. 7d.; loss, 369s. 13s. 8d. Cook's Kitchen, 1s. to 1s. 4d.; East Pool, 9s. to 9s. 4d.; Penstruthal, 1s. 6d. to 2s. 6d.; South Condurrow, 11s. to 12s.; South Frances, 8s. to 9s.; West Bassett, 4s. to 4s. 4d.; Wheal Agar, 3s. to 3s. 4d.; Wheal Bassett, 20s. to 25s.; Wheal Peavor, 9s. to 9s. 4d.; West Frances have been quiet this week, and are quoted 5s. to 6s. 4d.

COPPER MINES show very little change. At the Cornish Ticketing, on Thursday, the standard was 1s. better, being 85s. 16s. for 7s. produce, and the average price of the ore sold was 3s. 11s. 6d. per ton. Devon Consols, 1s. to 1s. 4d. At the Gawton Copper meeting a call of 4s. per share was made. The accounts, which bring up cost to March 28, show a balance against the mine of 637s. 16s. 2d. The copper ore sold realised 394s. 5s. 2d., Mellanar, 3s. to 4s.; the sale of ore on Thursday—500 tons—realised 1285s. West Seton, 12s. to 15s.; the mine is said to be looking well. The sale of ore—154 tons—realised on Thursday 734s. West Tolgus, 22s. to 25s.; the sale here—300 tons—brought 1608s. Wheal Crebor have advanced this week from 4s., and a large business done at from 5s. to 8s. A few months ago the shares rose from 2s. to 12s., and then gradually dropped to 4s. It is hoped the present rise will be more permanent. The lod in the winze below the 108 is worth 20s. to 30s. per ton. Parys Corporation, 10s. to 11s.; the mine has sampled 50 tons of precipitate of good quality. Morfa Du, 16s. to 18s.

LEAD MINES continue dull, and prices are merely nominal. Van 17 to 18: nothing new here. Roman Gravel has improved to 8s. 9s.; a good improvement has taken place here in the 40, where the lode has been cut into worth 2s. 4s. per fathom. Tankerville, 3s. to 3s. 4d.; Bettws-y-Coed, 1s. to 2s.; Clementina, 1s. to 1s. 4d.; Denbighshire Consols, 1s. to 1s. 4d.; D'Esreshy Mountain, 30s. to 35s.; East Van, 1s. to 1s. 4d.; Great Laxey, 15s. to 16s. Herodsfoot, 3s. to 3s. 4d.; the sampling here is rather over 40 tons of lead ore for six weeks. Leadhills, 1s. to 2s.; West Chiverton, 2s. to 2s. 4d.; West Holway, 1s. to 1s. 4d.; Pateley Bridge, 10s. to 12s. 6d.; the new machinery is finished, and will be at work in the beginning of next week. West Pateley, 2s. to 2s. 4d.; the lode in the 56 north-west of shaft, has produced 15 tons of lead ore on the last 10 fms. driven. Caron, 2s. to 2s. 4d.; Frongoch, 1s. to 1s. 4d.; Grogwinion, 2s. to 3s.; Hartington Moor, 1s. to 2s.; Mawston, 1s. to 2s.; Red Rock, 2s. to 2s. 4d.; St. Harmon, 1s. to 2s.; South Cwmystwith, 1s. to 2s.; West Wye Valley, 1s. to 1s. 4d.; Wye Valley, 1s. to 1s. 4d.; Gwernynydd, 4s. to 4s. 4d.

FOREIGN MINES.—Cape Copper, 27s. to 28s.; the directors have declared a dividend of 12s. 6d. per share. Arundel, 3s. to 4s.; Colorado, 1s. to 1s. 4d.; Don Pedro, 10s. to 21s.; Eberhardt and Aurora, 3s.

to 3s.; Frontino and Bolivia, 1s. to 2s.; Hultafall, 1s. to 2s.; New Quebrada, 2s. to 2s. 4d.; Panulicillo Copper, 25s. to 30s.; Richmond, 7s. to 7s. 4d.; Santa Barbara, 1s. to 2s. 4d.; Blue Tent, 2s. to 2s. 4d.; Placerville 2s. to 2s. 4d.; Canada Gold, 2s. to 2s. 4d.

The Market for Mine Shares on the Stock Exchange has not yet recovered from the almost total absence of business observable at the beginning of the week, in consequence of the holidays, yet the few transactions which have taken place have been almost invariably at full quotations. The unfavourable prospects of the metal markets have still a very depressing influence upon investors, and this feeling is augmented by the efforts of those seeking capital to prove that a rise in prices is to be expected, instead of accepting things as they are, and seeking the remedy in more economic and judicious management. It is beyond question that as to tin the immense resources of Australia and Tasmania alone, whatever tin speculators may say to the contrary, will long prevent any substantial rise. The cry is constant that the deposits of tin in those colonies are being worked out, but this assertion is refuted by the fact that, although low prices have lessened the production both in Australasia and in Cornwall, the diminution has been no greater in the former than in the latter. Moreover, the quality of the Kangaroo (Australian) brand of tin metal is fully equal to the best Lamb and Flag (Cornish) brand. The prices of tin is at present only kept up by the operations of the syndicate which has been formed to prop up prices, and as interest is being paid on the amounts borrowed upon the tin held a collapse must, sooner or later, result. As to copper, there is at present many years' consumption in stock, and in many colonial and foreign countries—Namuqualand, Newfoundland, and elsewhere—high produce copper ore can be raised so cheaply that the mines could be kept open with copper several pounds per ton lower than at present, so that no important rise can be expected here. Lead appears somewhat better than most other metals, but the trade is in such a transition state that it is difficult to pronounce a decided opinion. All these facts prove that it is to the increased introduction of machinery, which can now be obtained much more cheaply, and to more economic management rather than to better prices for metals that one must look for a restoration of profits, and as soon as these facts are appreciated and acted upon the profits of mining will be as great or greater than ever, so that capitalists who embark especially in new concerns placed on the market without a heavily loaded capital account can scarcely fail to reap the advantage upon the return of activity.

Cape Copper, 27s. to 28s.; at the directors' meeting, held on Wednesday, a dividend of 12s. 6d. per share, payable on June 24, was declared. Although the dividend is smaller in amount than many previous ones, the mere fact that with the copper trade in the present depressed condition even a 12s. 6d. dividend can be paid says much for the excellent system of management pursued.

Pontgibaud, 19s. to 21s.; the payment of the interim dividend of 10s. (8s.) per share commenced yesterday. An extraordinary general meeting has been called for June 19, and will be held at Paris, for the purpose of considering and determining upon a provisional agreement which has been made for the amalgamation of the Pontgibaud Mining Company with the Concorde Foundry and Rolling-mills Company, and for authorising the modifications in the statutes necessary for such amalgamation. Both concerns are practically under the control of Messrs. John Taylor and Sons, and the proposed arrangement appears to be very desirable.

Sentein, 2s. to 2s. 4d.; the managers report (May 31) is considered very encouraging. It states that everything goes well at the mine, where they have broken this week about 120 tons of silver-lead and blende ores. There is no change to note in any part of the lode. The No. 1 dressing-floor is completed, and the machinery thereon is in full working order, and dressing ore for market. The same remark applies to the No. 2 floors. They will send you samples of dressed ore for assay in the course of a few days. Weather at present changed for the better, fine and warm, and the snow melting fast. Should it continue, they will be able to complete the road to the mine, and begin bringing down mineral in a very short time. The total quantity of ore raised to the present date is 2705 tons.

St. John del Rey, 27s. to 28s.; an interesting statement as to the recent profits of this company has been prepared, from which it appears that in the five years since the re-opening of the mine after the great fire the company has paid in dividends, including the present one just declared, 180 per cent., and put 20 per cent. to the reserve. It has, therefore, earned in five years 200 per cent., or twice its capital, although that capital was much enlarged by the sinking of the two great shafts, and in providing new, improved, and additional machinery. Don Pedro North, 1s. to 1s. 4d.; the details given in the report concerning the 60 ft. wheel, &c., in which the chief interest is for the moment centered, has been anticipated by telegrams already published.

Richmond, 7s. to 8s.; the usual telegram received from the mines at Eureka, Nevada, states the week's run was \$50,000 from 875 tons of ore. During the week the refinery produced doré bars to the value of \$43,000. The manager (May 14) reports that since previous report operations both in mines and smelting works have been carried on with usual regularity, and in drifting north from No. 12 chamber they holed into a large cave; they are drifting from the northern end, and have very good indications for ore making in that direction. The chambers are looking about the same, and turning out the usual quota of ore. It is much to be regretted that one or two shareholders are still in favour of pushing the litigation, which many have hoped to be forgotten, with a view to a reversal of the decision of Judge Field, which was in favour of the Eureka Company against the Richmond Company. The latter company have a splendid mining property, and a wretchedly bad case at law, and should, therefore, be content to keep the former and abandon the latter, as the present executive wisely propose to do.

Flagstaff, 3s. to 4s.; the few additional details to hand concerning the decision of the Supreme Court of the United States do not furnish much more information than was published last week, and, so far as can be yet ascertained, the decision does not assist the interpretation of the conflicting enactments of the laws of 1866 and 1872. The Flagstaff Company defended the action in the Court below on the assumption that it could follow the rule "in its course or strike" until the claimed number of feet were covered. It came out in evidence that the disputed ground on the course of the vein was several hundred feet outside the Flagstaff side line, and a verdict was given against the company for \$4,000. The Court below refused to give the Flagstaff Company "the right to the lode for the length thereof claimed in the location notice, though it runs in a different direction from that in which it was supposed to run at the time of the location." In the Supreme Court of the United States all errors but one were waived by consent, so as to leave but one question to the Court, "Can the patentee of a mining claim follow the vein or lode in its course or strike beyond the surface lines of his claim?" This question, read in connection either with the original enactment of 1872, or the corresponding sections of the Revised Code, is so grossly absurd that it is not surprising that the decision upon it is illogical, and almost unintelligible. The question, as stated, assumes that the side line of a location could cut the lode at right angles to its course, which is obviously impossible, and hence the Supreme Court of the United States decided, practically, that any line of a location which cuts the lode in its course must be taken to be an end line. No other point was raised for Justice Bradley to give a decision upon, and upon this the Court holds that "the Flagstaff Company is outside its rightful boundaries, and it, therefore, affirms the judgment of the lower Court in favour of Helen Tarbet." There can be no doubt that whenever the question of working beyond side lines into the location of another owner comes before the Supreme Court of the United States it will be decided that both side lines and end lines must be held to be vertical, and that the law of 1872 supercedes that of 1866.

English-Australian, 3s. to 4s.; the report from Capt. Raisbeck, for the month to April 14 is considered very discouraging—there was no improvement in the lode, the tributaries' stopes were looking poor, and funds were getting low. The driftings south are virtually stopped, there is no paying quartz anywhere, and the runs of stone are getting smaller and poorer going north. In conclusion, Capt. Raisbeck says that "as Mr. Clarke informed me, we only had about the sum of 60s. in hand (we have about 30l. of mud at the mine), you will see it depends upon the tributors working and getting gold sufficient to carry on the work; should they fail, we must stop. We have reduced the working expenses to a minimum, having only three men working upon wages at present." Yorke Peninsula, 16th to 3s. 16th; pref. 3s. to 3s. 4d.; Capt. Anthony, after reporting on the various points of operation, says "The further deepening of the engine-shaft will be resumed, I hope, as soon as the contract to drive 25 fms. in the 4 is completed. . . . I regard the present as the most trying time we have ever experienced, and yet our actual circumstances were never so good." Ore Return: Shipped per Sir William Wallace (second shipment) 100 tons of 15s. per cent., on hand at the mine 288 tons of 14s. per cent., 470 tons of smalls of 5 per cent., and 1200 tons of dredge ore of 5 per cent. Port Phillip and Colonial, 3s. to 4s.; the March profit was 1067s. 12s. 11d., which, added to previous balance of 1499s. 8s. 8d., made an available balance of 2567s. 10s. 4d. Amount divided between the two companies was 1000s. The Port Phillip Company's proportion of which was 650s. The balance of 1597s. 10s. 4d. was carried forward to next month's account. The remittance on April 15 was 400s. A telegram, dated Melbourne, May 30, states that the profit for month to May 21 was 1004s. of which 600s. was remitted.

In Lead Mine Shares the amount of business done has been merely nominal. The position of the lead market has somewhat improved, and it is reported that in the United States a rise of nearly 2s. per ton has been established. Holders of shares in American lead mining properties are well pleased with their prospects. Van 17 to 18: operations are progressing with the usual regularity, but there is nothing calling for special remark.

Great Laxey, 15s. to 16s.; the mines still remain idle, the local directors being evidently indisposed to give the men any cause for saying hereafter that they were treated with undue severity. The importation of men to the island would be alike disadvantageous to the shareholders and to the miners—to the former because they would have to pay the travelling expenses, and to the latter because it would tend to render the over-supply of labour still greater. It is not every working miner who is content to remove from his mining district to another and maintain himself until he can obtain fresh employment.

Mineral Corporation, 10s. to 11s.; operations are going on as satisfactory as usual, but there is nothing calling for particular notice. The work is in course of execution will be completed by the time named.

Frongoch, 1s. to 1s. 4d.; operations going on as satisfactorily as usual, good returns of ore being made. Grogwinion, 2s. to 3s.; mine looking well at all important



ant points, Caron, 2 to 2½; no fresh news. Red Rock, 2 to 2½; mine showing signs of further improvement below the new shaft. Wye Valley, 1½ to 1¾; satisfactory progress continues to be made in the 2½ and deeper levels. West Wye Valley, 1 to 1½; nothing fresh to report. Crosswood, 1½ to 1¾; Mawston, 1½ to 2; Hartington, 1½ to 2.

Subjoined are the closing quotations:—  
Auchin, ¾ to ¾; Devon Great Consols, ¾ to 1 prem.; East Caradon, ¾ to ¾; Gwernymynydd, ¾ to ¾; Glyn, ¾ to ¾; Great Laxey, 1½ to 1½; Hington, ¾ to ¾; Down, ¾ to ¾; Leadhills, 1½ to 2½; Marke Valley, ¾ to ¾; Penarth, 1½ to 1½; Roman Gravel, ¾ to ¾; Tankerville, ¾ to ¾; Tincroft, ¾ to ¾; Van, 1½ to 1½; West Basset, ¾ to ¾; Wheel Crebor, ¾ to ¾; Wheel Grenville, ¾ to ¾; Almaden and Tinto, ¾ to ¾; Birdseye, ¾ to ¾; Blue Tent, 1½ to 2; Canada Gold, 2 to 2½; Cape Copper, 27 to 28; Chontales, 1½ to 1½; Colorado United, 1½ to 1½; Eberhardt and Aurora, ¾ to ¾; Exchequer, ¾ to ¾; Flanagan, ¾ to ¾; Frontino and Bolivia, 1½ to 2½; Hutaifall, 1½ to 2½; Kapang, 1½ to 1½; Last Chance, ¾ to ¾; New Tharsis, 1½ to 1½; New Quebrada, 2 to 2½; Placerias, 2½ to 2½; Port Phillip, ¾ to ¾; Richmond Consolidated, 1½ to 1½; St. John del Rey, 265 to 275; Sierra Buttes, 1½ to 2; United Mexican, 3 to 3½.

At Redruth Ticketing, on Thursday, 1282 tons of copper ore were sold, realising 4571.5s. The particulars of the sale were—Average standard, 85.16s.; average produce, 7½; average price per ton, 35.11s. 6d.; quantity of fine copper, 94 tons 7 cwt. The following are the particulars:—  
Date. Tons. Standard. Produce. Per ton. Per unit. Ore copper.  
May 1 144 88 8 0 7½ 3 3 0 9 6 47 10 0  
" 2 217 88 8 0 7½ 3 3 0 9 6 47 10 0  
" 3 114 88 8 0 7½ 3 3 0 9 6 47 10 0  
June 5 1282 85 16 0 7½ 3 11 6 9 8½ 45 10 0  
Compared with the last sale, the advance has been in the standard 1½, and in the price per ton of ore about 1s. 6d.

At the Swansea Ticketing, on Tuesday, 1093 tons of copper ore were sold, realising 9070.6s. 6d. The particulars of the sale were—Average standard for 9 per cent. produce, 77.2s. 10d.; average produce, 15 1-16; average price per ton, 81.5s. 2d.; quantity of fine copper, 165 tons 17½ cwt. The following are the particulars of the two last sales:—  
Date. Tons. Standard. Produce. Per ton. Per unit. Ore copper.  
April 22 1227 87 13 2 13 2 7 2 3 10 10 10 4 254 5 11  
June 3 1093 85 16 0 7½ 3 11 6 9 8½ 45 10 0  
Compared with the last sale, the decline has been in the standard 10s. 4d., and in the price per ton of ore about 1s. 7d. The Balade ore gave a produce of 16 9 16, and sold at 11s. 2d. per unit; Berehaven, produce 8½, per unit 11s. 0½d.; Virneberg, produce 14 1-16, per unit 10s. 7½d. There will be no sale on June 17.

The Rio Tinto Company publish the numbers of 800 of their Seven per Cent. Bonds, drawn on the 31st ult., for payment on July 1. They will be paid at par, either in Paris at the Crédit Industriel, or in London at the company's office. The numbers are also announced of 38,46 l. of the same company's Five per Cent. bonds that have been purchased and cancelled for the approaching half-year's sinking fund.

\* With this week's Journal a SUPPLEMENTAL SHEET is given, which contains: Original Correspondence: Depression of Trade, Probable Revival, New Process affecting Steel Manufacture, and the Iron Mining Districts of the United Kingdom; the Hauling of Coal Underground—No. II.; the London Coal Supply (W. J. Thompson); Pyrites (O. King); The Holloway Process (J. Holloway); Reducing Sulphides without Fuel; A New Process in Metallurgy (J. Holloway); Economic Alkali Manufacture; Boiler Explosions (R. Hunt); the Depreciation of Silver (J. Elliott); Manufacture of Iron and Steel; Mining Prospects on the Pacific Coast; Mining News from Utah (W. Bremeyer); Ruby Consolidated Mining Company; Richmond Company; Tharsis Mining Company; Chontales Mining Company (W. B. Palmer); Lead Mines in France; the Science of Mining (R. Knapp); Home and Foreign Production of Tin; Devon Great Consols—Holidays Question; Coad Mawr Pool Mine (W. Gabbott)—the Wild Duck, or Sportsman's Arms—Registration of New Companies—Improvements in Clearing Small Coal (Illustrated)—the Hand-Power Rock-Drill (Illustrated)—the Terrible Mine, Colorado—Patent Matters—Meetings of Richmond Consolidated and Ruby Consolidated Companies, &c.

WEST PATELEY (Lead).—This week's official report states that in the bottom level—67 fms. from surface—the vein is promising for a speedy improvement, as the perpendicular of the ore gone down in the level above is approached. The 56 north-west has been extended nearly 7 fms. during the month; the vein in this driftage for the last 10 fms. has produced 15 tons of lead ore, being an average of 30 cwt. per fathom. The Cranston's rock boring drill is working 15 hours per day, and very satisfactory progress is being made. The metal pitches are producing the usual quantities of lead. There are 20 tons of clean ore in the bin, and another 10 tons in course of dressing.

EAST LOVELL.—A great improvement is reported. Should a deposit of tin be reached here similar to the bunches that made this mine famous there will be great excitement in the shares.

BODIDRIS.—It will be seen by the agent's reports that the recent discovery of lead is proving continuous. Those mining engineers who lately inspected predict a successful future for the mine.

LEVANT.—Another improvement has occurred at this mine, the men working in the 210 east and on the north lode having cut a fine lode of tin and copper. The lode in the 270 fm. level continues to look well.

WHEAL SISTERS.—A four-monthly meeting of shareholders was held at the mine on Wednesday, Mr. T. W. Field, the purser, in the chair. The accounts showed total costs of 7336l., against receipts of 6670l., leaving a loss of 666l. on the four months' working up to the end of April. No call was made, the balance being carried forward to the next account.

WHEAL NEWTON.—This mine having been idle some eight months has been re-started under the name of Newton Silver Mining Company (Limited). Some of the shareholders in the late company, residing principally in Birmingham, have subscribed capital for further explorations in the silver lode.

PENSTRUTHAL.—A proprietor has just issued a communication to his fellow-shareholders (which will be found in another column) advocating a division of this large sett by forming a new company to re-work what is known as the Old Mine. Previous to 1872 and the formation of the present company the old mine made very large returns (over 200,000l.), and gave good dividends from a large bunch of copper ore above the 120 fm. level. On the formation of the present company tin was at a high price, and the works were opened on the Highborough tin lode, and, notwithstanding the heavy fall in the price of mineral at the time and since the mine began to make returns, tin and copper from this lode to the value of about 20,000l. has been sold, the mine looking at the present time exceedingly promising for large returns in depth. It would be for the interest of the proprietors to assist in the formation of the new company, as they would not only have a share in a property which it is believed will be found to be far richer below the 120 than ever it was above, but from the purchase money they would have the means of resuming with vigour their own mine in depth, and the continuing the cross-cut to cut the 40 ft. lode—both very important objects. Nothing need be said about the richness of the Gwennap district, in which Penstruthal is situated; it adjoins Tresavean.

THE IRON AND STEEL EXHIBITS AT THE PARIS EXHIBITION.—The exhaustive and interesting report to the United States Secretary of State on the Iron and Steel Exhibits at the Universal Exposition of 1878, at Paris, by Mr. Daniel J. Morrell, has just been issued by the American Iron and Steel Association. The author states that by far the finest exhibit of iron and steel and their products ever made by France was made at her own Exposition in 1878. Her exhibit of iron and steel proper excited the astonishment and elicited the admiration of all who thoughtfully examined it. The exhibit at Paris by Great Britain of iron and steel and their products she describes as extensive, varied, and exceedingly suggestive of mechanical excellence. Germany was not represented. There is, Mr. Morrell remarks, something amazing in the comparative prosperity of Belgian iron and steel industries, with their spare natural resources, at a time when the same industries in more favoured countries are experiencing more or less depression. The United States is second only to Great Britain as an iron and steel producing nation; but, probably owing to the distance from Paris, was inadequately represented in quantity, though the quality left nothing to desire. The report cannot be too highly commended, and its circulation amongst the iron and steel manufacturers of the

United States cannot fail to do much to advance the industry which they represent.

## GEOLOGICAL SOCIETY OF LONDON.

MAY 28—HENRY CLIFTON SORBY, F.R.S. (President), in the chair.

Edward Garlick, C.E., Winckley-square, Preston, was proposed as a Fellow of the Society.—Noel W. Rudston-Read, St. George's-road, will be balloted for as a Fellow; and Mr. Elouard Dupont, of Brussels; Dr. Franz von Kobell, of Munich; and Dr. Emile Sauvage, of Paris, as Foreign Correspondents of the Society.

The following communications were read:—  
1.—"On the Endothiodont Reptilia, with evidence of the species Endothiodont uniseries, Owen," by Prof. R. Owen, C.B. F.R.S., F.G.S.  
2.—"Note (third) on Eucamerotus, Hulke, = Ornithopsis, Seeley, = Bothriospondylus, Owen, = Chondrosteosaurus, magnus, Owen," by J. W. Hulke, F.R.S., F.G.S.

3.—"Description of the species of the Ostracod genus Bairdia, McCoy, from the Carboniferous Strata of Great Britain," by Prof. T. Rupert Jones, F.R.S., F.G.S., and James W. Kirkby.

4.—"Report on a Collection of Fossils from the Bowen River Coal Field and the Limestone of the Fanning River, North Queensland," by R. Etheridge, jun., F.G.S.

5.—"On a Fossil Squilla from the London Clay of Highgate, part of the Wetherell Collection in the British Museum," by H. Woodward, LL.D., F.R.S., F.G.S.

6.—"On Necrosilla Wilsoni, a supposed Stomatopod Crustacean from the Middle Coal-measures, Cressall, near Ilkeston, Derbyshire," by H. Woodward, LL.D., F.R.S., F.G.S.

7.—"On the Discovery of a fossil Squilla in the Cretaceous Deposits of Hakei, in the Lebanon," by H. Woodward, LL.D., F.R.S., F.G.S.

8.—"On the Occurrence of a Fossil King-Crab (Limulus) in the Cretaceous Formation of the Lebanon," by H. Woodward, LL.D., F.R.S., F.G.S.

The next meeting of the society will be held on June 11, when the following communications will be read:—1. "On a Mammaliferous Deposit at Barrington, near Cambridge," by Rev. O. Fisher, M.A., F.G.S.—2. "The Pre-Cambrian Rocks of Shropshire" (part I), by C. Callaway, D.Sc. Lond., F.G.S.—3. "The Formation of Rock-basins," by J. D. Kendall, C.E., F.G.S.—4. "On the Occurrence of a Remarkable and apparently New Mineral in the Rocks of Inverness-shire," by W. Jolly, F.R.S.E., and J. M. Cameron, F.C.S.; communicated by Prof. J. W. Judd, F.R.S., F.G.S.—5. "Further Discoveries in the Cresswell Caves," by Prof. W. Boyd Dawkins, M.A., F.R.S., F.G.S., and the Rev. J. M. Mello, M.A., F.G.S., with notes on the Mammalia by the former.—6. "On the Probable Temperature of the Primordial Ocean of our Globe," by R. Mallet, F.R.S., F.G.S.—7. "On Lepidodiscus Lebouri, a new Species of Agelacrinites from the Carboniferous series of Northumberland," by W. Percy Sladen, F.G.S.

## TREATING PYRITES RESIDUES.

Some further improvements in the treatment of the residues resulting from the burning of pyrites and other sulphides, have been invented by Mr. JAMES MASON, of Eynsham Hall, Witney, which consist in effecting the elimination of practically the whole or part of any residual sulphur which may remain in the form of a metallic sulphide, such, for example, as sulphide of iron, or of copper, or of lead, by first either submitting the burnt ore to the action of heat, either in a closed or in a partially closed furnace, by preference with the admission of air in order that the metallic sulphides may be reacted upon by the metallic oxides, and thus by mutual decomposition sulphur in the form of sulphurous acid may be liberated and the resulting residue be rendered more suitable for the production of iron and steel. Or in such cases where the ore has been rendered or has become so disintegrated as that its direct employment in the blast-furnace would not be advantageous, he causes it before being submitted to the sulphur eliminating process before mentioned to be mixed or incorporated with clay, and when such mixture has attained the desired consistency he causes the same to be moulded into bricks or other suitable forms, and after having been dried the same are placed in a kiln, such, for example, as a fire-brick kiln, and are subjected to heat or are burnt during such operation.

The reaction between the metallic sulphides and the metallic oxides takes place, and sulphur in the form of sulphurous acid is eliminated; the resulting burnt product will then be found both chemically and physically better suited for employing in the production of iron in the blast-furnace. He wishes it to be understood that he does not propose to apply these processes to the treatment of all burnt ores, such for example as those known as purple ores, and which are produced or result from those processes known as Longmaid's and Henderson's, but he wishes to limit himself to the treatment by the processes herein described of burnt residues containing sulphur resulting from the burning of iron pyrites, or of pyrites of those classes which are referred to in the patents previously granted to him, and more particularly to those burnt residues which are obtained from pyrites specially referred to in the Specification of Letters Patent granted to him in 1877, as the burnt residues therefrom always contain a notable quantity of sulphur in the form of metallic sulphide.

THE COST OF THE DURHAM STRIKE.—It is estimated that the loss in wages occasioned by the late strike of colliers at Durham amounts to 640,000l., 240,000l. of which was borne by the men. Each miner has, it is said, lost 6l. in wages in a strike in gaining 1½ per cent. better terms than the owners offered at first, 1½ per cent. being 3l. in the 1l. The colliers will have to work 9½ years to recover the 6l., without reckoning interest.

MR. WILLIAM H. H. WATSON begs to offer his advice and services to Shareholders and Intending Investors in Mines, and in the Purchase and Sale of Shares. Has Special Business in WHEAL CREBOR; and 25 shares in ARENDAL FOR SALE at £38 net, £4 paid.

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FOR SALE.—THREE FOUR-WHEEL COUPLED TANK ENGINES, 9 in. cylinders, 4 ft. 8½ in. gauge, and ONE SIX-WHEEL COUPLED, 12 in. cylinders, 4 ft. 8½ in. gauge,—all by MANNING, WARDLE, and Co., Leeds; in good working condition. For further particulars and prices, apply to W. J. HARMAN, 35, Queen Victoria street, London, E.C.

## ROYAL CORNWALL POLYTECHNIC SOCIETY.

and PRIZES will be AWARDED in the MECHANICAL, FINE ART, PHOTOGRAPHY, NATURAL HISTORY, and other DEPARTMENTS. For Prize Lists, Entry Forms, and all information, apply to the Secretary, EDWARD KITTO, Polytechnic Hall, Falmouth.

## TO MINE AGENTS.

VERY SUPERIOR DIAL, with graduated Arc and Telescope, has not been used, and WILL BE SOLD CHEAP. For particulars, address to "S." MINING JOURNAL Office, 26, Fleet-street, London, E.C.

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NEW GUIDE TO THE IRON TRADE. By JAMES ROSE. Price 2s. 6d.; by post, 9s.  
JOINT STOCK COMPANIES, AND HOW TO FORM THEM. By THOMAS TAPPING. 1s.  
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LEAD ASHES, LEAD SLAGS, SULPHATE OF LEAD, HARD LEAD, BRASS SLAGS AND ASHES, COPPER REGULUS, MATTE, SCORIA, TIN ASHES, TERNE ASHES, &c., and MIXED ORES or REFUSE, containing LEAD, COPPER, TIN, or ANTIMONY.

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## AUSTRALIAN TIN—PRIZE MEDAL, 1877.

THE UNDERSIGNED is PREPARED TO EXECUTE ORDERS for the CELEBRATED

## "KANGAROO" BRAND.

S. L. BENSUSAN.

Kangaroo Tin Works, Sydney, December, 1878.

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A LARGE QUANTITY OF FOREIGN FOR SALE, at prices very much below ordinary quotations. Apply to—  
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## ENGINE BOILERS.

WANTED, a GOOD SECOND-HAND CORNISH BOILER, with two tubes not less than 25 ft. long, to stand a working pressure of 45 lbs. per square inch. State age, make, and price. Address, "Box 77," Post Office, Swansea.

## SPAIN AND PORTUGAL.

MR. J. T. JOHNSON, Assoc. Inst. C.E., F.G.S., &c., CIVIL and MINING ENGINEER, late of Chester and South Wales, having joined his Brother, Mr. T. M. JOHNSON, who for the last thirteen years has been engaged in Mining in Spain and Portugal, is prepared to INSPECT PROPERTIES and CARRY OUT GENERAL MINING AND ENGINEERING WORKS in those countries.

Address: CORREIO DO CORVO, PORTUGAL.

LEAD ORES.				
Date.	Mines.	Tons.	Price per ton.	Purchasers.
May 30—Minera	.....	50	£ 8 16 0	Walker, Parker, & Co.
— ditto	.....	50	8 16 0	ditto
— ditto	.....	60	8 11 6	ditto
— ditto	.....	40	8 14 0	ditto
— ditto	.....	15	9 0 0	ditto

BLENDE.				
Date.	Mines.	Tons.	Price per ton.	Purchasers.
May 30—Minera	.....	60	£ 3 1 6	Villiers Spelter Co.
— ditto	.....	58	3 0 6	ditto
— ditto	.....	50	3 3 0	ditto
— ditto	.....	52	3 4 6	ditto
— ditto	.....	42	3 6 6	ditto
— ditto	.....	27	2 18 6	ditto

COPPER ORES.							
Sampled May 21, and sold at Swansea, June 3.							
Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Balade	75	18½	£9 7 0	Virneberg	9	5½	£23 10 0
ditto	75	18½	9 7 0	ditto	4	25	13 13 0
ditto	75	18½	9 7 0	Knockmahon	75	8½	2 1 6
ditto	75	18½	9 6 6	Sobral	45	16½	9 1 6
ditto	73	18½	9 2 6	Copper Pre. 34	87	30	2 6
ditto	73	18½	9 1 6	ditto	6	1½	7 8 0
Berehaven	144	8½	4 16 0	Emily Ore	18	2½	1 7 0
ditto	94	8½	4 16 0	ditto	5	5	2 5 0
Virneberg	62	13	6 17 0	Tigrony Pre.	9	29½	14 10 0
ditto	62	13	6 17 0	Copper Ore	7	24½	13 16 0
ditto	28	21½	11 12 0	ditto	1	41½	23 0 0
ditto	25	12½	6 14 6	Copper Reg.	9	35½	19 4 0
ditto	8	15½	7 16 0	Copper Pre.	7	59½	31 1 0
TOTAL PRODUCE.							
Balade	446	£4131 14 6	Emily Ore	21	£ 32 17 0		
Berehaven	238	1143 8 0	Tigrony Precip.	9	130 14 6		
Virneberg	199	1483 3 0	Copper Ore	8	119 12 0		
Knockmahon	76	157 16 0	Copper Regul.	9	173 16 0		
Sobral	45	408 7 6	Copper Precipitate	7	217 7 0		
Copper Precipitate	43	108 13 0					

COMPANIES BY WHOM THE ORES WERE PURCHASED.				
Names.	Tons.	Amount.		
Copper Miners' Company	186	£ 1,411 1 0		
P. Grenfell and Sons	60	1,471 6 6		
Williams, Foster, and Co.	729	5,882 10 0		
Mason and Elkington	9	173 16 0		
Sweetland and Co.	108	213 1 0		
Landore Copper Company	8	119 12 0		
Total	1093	£ 9,070 6 6		

NO SALE on June 17.

TOTALS AND AVERAGES.				
Whole sale	21 cwt.	Produce.	Price.	Per unit. Standard.
May 1093	15 1-16	£5 5 2	10s. 11d.	£77 2 10

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Mellanear .....	85 .....	£2 16 6	East Pool .....	72 .....	£2 15
ditto .....	76 .....	2 13 6	ditto .....	54 .....	2 8
ditto .....	75 .....	2 11 6	West Soton .....	48 .....	2 10

Mellandear	85	£2 16 6	East Pool	72	£2 15 6
ditto	74	2 13 6	ditto	54	2 8 6
ditto	75	2 11 6	West Seton	46	3 19 6
ditto	74	2 13 6	ditto	41	6 0 6
ditto	71	2 10 0	ditto	39	3 7 6
ditto	69	2 11 6	ditto	28	6 8 6
ditto	50	2 0 0	Crinia & Carlyon	35	5 0 0
West Tolgus	74	4 11 6	New Cook's Kitchen	35	4 10 0
ditto	71	4 9 6	Carn Brea	29	2 15 0
ditto	60	6 3 0	Wheel Basset	12	2 13 0
ditto	55	6 4 6	ditto	1	4 15 6
ditto	45	6 0 6	Cook's Kitchen	10	2 4 0
East Pool	80	1 10 6			

TOTAL PRODUCE.									
Mellanear .....	500	.....	£1285	18	6	New Cook's Kitch. ....	35	.....	£ 168 0
West Tolgus .....	300	.....	1608	13	0	Carn Brea .....	29	.....	79 15
East Pool .....	206	.....	450	19	0	Wheel Basset .....	13	.....	36 11
West Seton .....	184	.....	734	8	0	Cook's Kitchen ...	10	.....	32 0
Crinia & Carlyon, 35	.....		175	0	0				

Average standard .....	£ 85 16 0	Average produce .....	£ 11 6	7½
Average price per ton .....	1282	Quantity of fine copper 94 tons 7 cwt.		
Quantity of ore .....	1282	Amount of money .....	£4571 5 0	
LAST SALE.—Average standard .....	£88 0 0	Average produce .....	£ 11 6	6½
Standard of corresponding sale last month, £ 84 10 0—Produce, 7½				



### Notices to Correspondents.

\* Much inconvenience having arisen in consequence of several of the Numbers being sent out of print, we recommend that the Journal should be kept on receipt; it then forms an accumulating useful work of reference.

\* We are compelled to postpone until next week letters from Mr. H. D. Hoskold and Mr. W. Salmon on—Is it Right to Pay any Purchase Money for Mines? Received,—"B. J. J." (San Francisco)—"C. G. H." (Pittsburgh)—"H. T."—"T. C. A."—"Shareholder" (Richmond)—"J. S."—"W. B. P."—"R. A."—"P. E."—"Shareholder" (Great Laxey)—"L. E."—"P. W. O."—"S. C."—"Shareholder" (Devon Great Consols)—"Constant Reader" (Aberystwith)—"Mentor" (Redruth): We have no space for so lengthy an article on Ameliorating the Position of the Working Classes—"R. C."—"J. W." (Hayle): MS. returned.

## THE MINING JOURNAL.

### Railway and Commercial Gazette.

LONDON, JUNE 7, 1879.

#### LABOUR SAVING MACHINERY.

The necessity that exists for economising labour in the production of machinery is now being more fully recognised by our manufacturers than formerly, and amongst the recent inventions in that direction is the "Stellite Lathe," which has just been brought out by the Messrs. POLLOCK, engineers, Leeds, and was put into operation a few days ago in the presence of representatives of some of the largest machine and engine firms in the kingdom. By the new system a vast amount of work is done in the making of axles, piston-rods, connecting-rods, &c., without taking the article in its various processes from one lathe to another, and brings various lathes under the control of one person. By this arrangement a strong base-plate carries at each end a bearing raised about 3 ft. above its surface, and in the bearing is a central tubular shaft, having several flat sides, each of which has a centre longitudinal groove, being thus a complete and independent lathe-bed, with a fixed headstock at one end and a loose headstock at or near the other end. The centres thus radiate from the central tubular shaft, and whilst able to turn round the common centre with it, there is an independent rotary motion of each round their own axis, similar to the relative motion of satellites round the central planet. The lathe-beds formed on the sides of the central shaft carry headstocks, but no slide-rests. Each slide-rest, however, has an independent bed, which are ranged radially at equal distances, so that when the headstocks are in working position each one is in position with one of the rest-beds. Each pair of headstocks, with its central fixing and rest-bed, consequently forms a complete lathe. Of the rest-beds two are below the centre shaft and attached to the base-plate; then there are two on each side and two above. Assuming that the central shaft is the centre of a clock face, the rest-beds would be located at figures 1, 3, 5, 7, 9, and 11, and they are fixed at each end to rigid framework circling round the central shaft in the form of a horseshoe. The fast headstocks are of the ordinary kind, with steel spindles extending beyond the former, and with caps and bosses, the spindles carrying the spur pinions by which they are actuated outside, and beyond these is a claw-clutch with an ordinary tail-pin. The spur pinions are driven by a central spur-wheel, which gears into all at once, and is keyed on a short tube revolving on a central continuation of the central shaft, whilst the other end of the tube—which is made long enough to clear the clutches and tail-pin—carries a worm wheel being actuated by a worm attached to the first driving shaft of the machine, which is driven by a wire pulley or some other convenient means. The rest-beds and central shaft may be of any ordinary length to suit the size of the object to be turned. In the lathe made by the Messrs. POLLOCK the extreme distance between the centres was 5 ft. 6 in., giving a length of about 14 ft. to the base-plate. Self-acting motions were given to each of the slide-rests along their rest-beds, or in other directions through the medium of a strong bar extending through the centre of the central tubular shaft, and having bearings at each end of it. The sliding-bar receives a longitudinal traverse by means of a rack and pinion, suitably driven by worms and worm-wheels so as to produce the requisite cut. By a simple arrangement, however, the worm gearing may be disconnected, and spur gearing acting in the opposite direction brought to bear so as to give a rapid return motion.

Assuming that an hour and three quarters were occupied in the cutting traverse the return would be effected in less than a minute. At the end beyond the fast headstocks the sliding-bar carries a large disc, round the circumference of which are fixed the ends of connecting rods, so arranged that their lengths may be adjusted by screws and hand wheels. The other end of the connecting rods are attached direct to the slide valves, so that the rests are pulled along their beds by the traverse of the sliding bar, or are connected by intermediate levers and other special arrangements when the tools are required to traverse in a part of a circle or do other irregular work. By making one of the rods pull a rack along, one of the rests is made to surface the ends of the objects being turned, the nut in the top rest being made a pinion rotated by the traverse of the rack. The hollows at the end of connecting rods are formed by special tool-holders swivelling on a centre placed at the required radius, whilst the longer arm of the tool holder projecting backwards is connected with the traversing disc and so made to pass through the quarter of a circle or other required segment. In the making of connecting rods the lathe is started empty, and one of the headstocks thrown out of gear, and a forged rod is placed in the centre. The forging being properly centered, the central tubular shaft is made to rotate by a large handle and worm at the loose headstock end of the shaft acting on a worm-wheel keyed to the shaft. The worm-wheel is provided with a strong rim accurately divided into six parts, and there is a powerful screw and wedge arrangement to hold the shaft rigidly in position at each of the six divisions, so that when the shaft has been turned round to the next division and the forging has got to a certain position, and the screw and wedge are tightened down, the forging is in the right position to undergo its first "roughing cut." The roughing cut being finished the tools are rapidly returned to their starting position by means of the reversing gear, the second forging is moved up to a higher position, the first forging moves on to have a finishing cut taken off the two hollows by two more rests at a more forward point, and another forging is inserted as in the first instance. This traverse being completed, another move about the sixteenth of a revolution is made, and the first forging comes to a more forward position about three on the dial alluded to, when a roughing tool commences to slide from the beginning of one hollow to the end of the other, and so taking off the back between hollow and hollow. Whilst this is being done the second and third forgings are undergoing the finishing and roughing cuts at their hollows, and another forging is inserted at the original place stated. The first forging arrives at another point like the figure 5 on the dial and receives the finishing cut between hollow and hollow, and then moves on, all the other operations being still carried on. By the new process no less than eight tools are working at one and the same time, and as all the operations are self-acting each tool is kept to its one special work, requiring no change, ample time being given for any necessary finishing touches as are required where the forged iron is first placed for taking out the finished article and inserting in its place a fresh forging whilst the traverse takes place. The whole time occupied by a traverse of about 3 ft. 6 in. is about one hour and three quarters.

In connection with the new appliance there are special methods for lubricating the tools, the top stay of the machine from frame to frame being made to act as a cistern, the lubricating fluid being conducted by flexible pipes to the points of each tool and regulated by taps. From the tools the fluid finds its way into two inclined troughs in the base-plate, and a small pump which is kept continuously working returns it back again to the cistern, so that the

tools are always kept cool and are able to stand the utmost amount of work without grinding. The invention appears to be a most valuable economiser of physical labour, and it only requires to be known to come into general use by our engineers and machinists.

#### COAL IN TURKEY.

It was scarcely to be expected that the wellnigh hopeless disorder to which the finances of Turkey have been reduced since the autumn of 1875 would have the effect of stimulating in any way the development of the undoubtedly vast resources of the Ottoman Empire. On the contrary, the helplessness of the Turkish Treasury has increased the industrial helplessness of Turkey generally, and the wealth of the Turkish soil appears to be further removed than ever from a profitable utilisation. Yet Turkey is rich in that great source of modern industry and wealth—coal. For instance, a valuable coal seam exists close to the village of Dimosli, near Podgoritz. There is a road leading to it across a plain of about eight miles, and this road is stated to be quite practicable for wheeled traffic. Another coal seam, but of less valuable quality, is situated near Dalcigno, and has, consequently, fallen into Montenegrin hands. Recent explorations have discovered extensive coal fields to the westward of Heraclea, towards the River Sakaria, and also to the eastward of Amassera, towards Ineboli. Another coal field has been discovered beyond the boundary of the Imperial coal fields, commencing near the port of Umé, and extending 20 miles inland; the coal raised from the new field presents a great resemblance to South Welsh coal, but in one place anthracite of exceptionally good quality has been found. It is not at all improbable that other Turkish coal fields would be discovered if there were only the faintest chance that the successful explorers would be ultimately rewarded for their labour and protected in the enjoyment of their enterprise and property by just, impartial, and well-administered laws. The already known coal beds of Turkey would, however, satisfy all the present requirements of the Turks if they were properly worked; but instead of being properly worked they are allowed to languish on just anyhow. It may be remarked that during the progress of the Crimean War in 1854, 1855, and 1856 the mines of Heraclea largely supplied the British fleets with coal; but since those eventful years they have been comparatively, although not entirely, neglected, and the Turkish Government has even been fain to purchase considerable quantities of English coal. These purchases went on even during the coal famine of 1873 and 1874; and it is believed that during the war of 1877 the Turkish Government would rather have purchased English coal than have raised coal from its own mines. The emptiness of the Turkish Treasury, however, rendered it impossible for the Turkish Government to purchase English coal to any extent last year or in 1877. As it was necessary that the Turkish navy should be coaled by some means or other, the Turkish Government, wise for once in its generation, exempted the Heraclea coal miners from military service and paid them cash wages. By this means the Turkish authorities were enabled to raise from their own mines on the Black Sea nearly all the coal required for the Turkish fleet during the twelve exciting months ending with March, 1878. This was satisfactory as far as it went; but, after all, it was only another illustration of neglected opportunities.

We have said that Turkey would probably have purchased English coal instead of utilising her own coal had the condition of her Treasury enabled her to do so. That there is some ground for this conclusion is shown in the fact that in 1874 the quantity of English coal imported into Turkey was 220,000 tons; in 1875, 187,000 tons; and in 1876, 210,000 tons. In 1877, when the breakdown of Turkish resources may be said to have become complete, the imports receded to 145,000 tons. The price of the English coal imported by Turkey of late years has ranged between 17. 6s. and 21. 2s. per ton, so that Turkey may be said to have expended about 300,000l. per annum for English coal until she became unable to make any more purchases of it. It is thought by some that if the Government of the Sublime Porte had but exhibited a reasonable amount of energy, industry, and enterprise, Turkey might have exported as much coal during the last five years as she actually imported from England in the same period. Should this really be the case Turkey has lost 3,000,000l., or thereabouts, since 1874, through the strange listlessness and inaction exhibited by the Turkish Government during that period in the matter of coal mining, and, indeed, in the matter of almost everything else.

#### THE MAKING OF STEEL FROM COMMON ORES.

##### LINCOLNSHIRE IRONSTONE.

The increasing demand for steel, and the low price at which it is produced in certain districts, has led some of the manufacturers in Sheffield to see whether the nearest ironstone field to them cannot be taken advantage of so as to produce steel as low as it can be made by the new process in the Cleveland district. Consequently some experiments have recently been made with the Lincolnshire stone for the purpose of testing its adaptability for conversion into steel. The ore has long been smelted in the Sheffield district, and the pig made from it has been adapted for both foundry and forge purposes. Still, the stone varies a good deal, being most uneven, and it has been found necessary to select it for special purposes from different places. In North Lincolnshire there was dug with the stone a very large quantity of limestone more than was required for smelting, and the great difficulty in the past has been getting rid of the extra quantity of lime. It has been laid down by our ablest ironmasters that a free working cinder in a blast-furnace must have the lime equal to the alumina, plus half the silica. It may, therefore, be taken as an impossible matter that with so large a quantity of lime and so small a quantity of silica and alumina as are found in some of the Lincolnshire stone that it can be fused at the ordinary temperature, and produce a good quality of iron. In some of the upper parts of the ironstone the limestone is intermittent with the ore, but in some instances there was fossiliferous limestone containing from 14 to 15 per cent. of metalliferous ironstone. The working through so much limestone had been a great annoyance to several of the ironmasters in the district, but that to a considerable extent has been got over by mixing the stone found in the neighbourhood of Frodingham with the stone found near to the city of Lincoln, which is far more silicious, and is mined, whilst that in the former is obtained close to the surface. The Mid Lincoln Iron Company, of which Mr. W. ROSEBY is the managing director, now supplies a large quantity of stone to the companies in the northern part of the county, as well as to some of the smelters in the neighbourhood of Sheffield. The admixture regulates the quantity of lime found in the surface ores, and the result is that a good quality of pig is produced. But the stone raised near to the city of Lincoln is capable of making a very fine quality of iron used by itself, whilst it is much richer in metallic iron than that found in other parts of the county. The analysis gives the following results:—Peroxide of iron, 60.91; manganese, —; alumina, 5.47; lime, 1.60; magnesia, 0.06; phosphoric acid, 1.02; sulphur, 0.03; insoluble matter, 15.80; carbonic acid and water, 15.35 = 100.24; metallic iron, 42.61.

Such a stone as the above it is evident is well adapted for steel-making, and, indeed, all the stone found in Lincolnshire, if judiciously selected, could be converted into steel direct by the new process. Mr. D. ADAMSON, no mean authority where iron is concerned, and who was amongst the earliest of the ironmasters who established works in the Frodingham district, states that if the stone were worked simply as an ironstone the Lincolnshire iron field would be able to hold its own under almost any circumstances and conditions of trade that might arise in this country, and some of the more favoured and less variable mineral districts—taking Cleveland for instance—would not, certainly, be able to produce a ton of iron more cheaply than it could be made in Lincolnshire if that proper and moderately careful selection was adopted, instead of one of random recklessness, where the value and character of the material was not taken into account. It has generally been considered that no district in the kingdom would be at all able to compete with Cleveland in the making of steel direct by the new process, and that our Bessemer makers and rollers of steel rails in Sheffield and in Derbyshire would be unable to meet those in the North of England

either in the home or foreign markets. But it is evident from what we have stated above that our inland makers of Bessemer rails will not be placed in the unfavourable position that many persons conversant with the trade have believed to be inevitable. On the contrary, we believe that Lincolnshire will be able to hold its own, and that the Bessemer makers of Sheffield will not be placed in a worse position than they are at present as compared with those in the North of England who have the great advantage of a seaport.

The Lincolnshire ironstone field is a comparatively short distance from the South Yorkshire district, as it is also from Leeds; and at Ardsley, near the latter place, it has been extensively used in the furnaces of the West Yorkshire Iron and Coal Company. The stone to the latter, however, comes from Saxby, and differed materially from that raised at Frodingham, there not being an excess of lime in it. According to Mr. RILEY, who has given a good deal of attention to the stone from his connection with the works at West Ardsley, it was exceedingly good, chemically speaking, and they had only to put it into the crucible with a little charcoal and it would smelt itself beautifully. By pressure it could be formed into very good bricks, and by roasting it would form a very solid ironstone. Of course, there is the disadvantage of some of the stone having an excess of lime, and containing a considerable quantity of moisture, requiring an increased quantity of fuel. But, as we have before pointed out, a careful selection from different districts will adjust the superfluous and unnecessary ingredients found in some of the stone, particularly that worked at Frodingham. This has recently been done in the experiments made, and the result is that a fine quality of iron has been produced easy of conversion into Bessemer by the direct process. As a good deal of the stone is richer in metallic iron than that raised in Cleveland there will be a slight advantage to be placed to the credit of those who purpose making Bessemer principally from the Lincolnshire stone, and in addition to those in Sheffield who purpose doing so it is understood several of the furnaces in the Frodingham district, which now number 22, will be adapted for the making of Bessemer by the direct process, from which it could be sent direct to some of the mills which are not connected with blast furnaces. It may also be said that the South Yorkshire coal field is not far from the ironstone districts of Lincolnshire, and that the colliery owners in the former are now turning out a superior quality of coke, much of which is said to be equal to the Durham, and at a less price to the smelters. In the increased competition which must be the result of the new mode of making steel from inferior ores we think Sheffield will not be placed in a worse position as regards the manufacture of steel rails than it is at present, for the makers have had nothing to complain of since the Bessemer process was thrown open to all by the expiration of the patent. Lincolnshire will be able to provide an almost inexhaustible quantity of stone at a low price, and with cheap fuel as well there is no doubt but what the mills will be kept well going not only in Sheffield but in Derbyshire as well. The experiments made we may say have been in every way satisfactory.

**MUSEUM OF PRACTICAL GEOLOGY.**—The Duke of Richmond has appointed Prof. F. W. Rudler, of the University College of Wales, Aberystwith, to the offices of Curator of the Museum of Practical Geology and Registrar of the Royal School of Mines. Professor Rudler was for 15 years assistant-curator in the Museum of Practical Geology under Mr. Trenham Reeks, whom he has now succeeded.

**MINERALOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.**—A general meeting was held at the Meteorological Office, Victoria-street, London (Prof. T. G. Bonney in the chair), on Tuesday (14 corresponding members, 8 ordinary members, and 2 associates were elected), when the following papers were read:—On Abriachnites, a new Scottish Mineral, by Prof. M. F. Heddle and Dr. W. H. Aitken. On Haughtonite, a new Mica, by Prof. M. F. Heddle. On Breckite and Xantholite from Scotland, by Prof. M. F. Heddle. On Cristophite from St. Agnes, Cornwall, by J. H. Collins, F.G.S. Minerals from Japan, by John Mils. On Some Gold Occurrences, by the Rev. J. Clifton Ward, F.G.S. Additional Note on Penwithite, by J. H. Collins, F.G.S. Measurements of Angles of Basaltic Columns at the Giant's Causeway, by Profs. Jellott and O'Reilly.

**SOCIETY OF ENGINEERS.**—At the meeting of members, on Monday, a paper will be read on the Mineralogy of the Island of Sardinia by Mr. Charles J. Alford, the leading features of which are as follows:—Physical and geological features of the island. Laws relating to mining operations, and results of their working. Mining districts and working mines in the island. Unexplored districts, with the author's experiences in prospecting. Veins and other deposits of lead, silver, calamine, copper, iron, and coal. Carboniferous deposits of the island; their extent and value. Value of Sardinian tertiary coal, compared with the true coal, as a gas producer and as a furnace and steam coal. Use and value of tertiary coal of the countries bordering on the Mediterranean.

**MINING IN CYPRUS.**—We are informed that Capt. Joseph Jewell, of Redruth, Cornwall, has been deputed by a first-class firm in London to go out to inspect and report on some extensive mining properties in the island of Cyprus. We know from past experience that Capt. Jewell is a first-class mining engineer and mineralogist, and that he will furnish a true and faithful description of the mineral resources of the island. We believe this to be the first time an English mining engineer has been called on to visit this island professionally. Capt. Jewell leaves London on the 8th inst.

**UTILISING SULPHIDES AS FUEL.**—The new Holloway Process of utilising sulphides as fuel for extracting metals from their ores is attracting a great deal of attention. The smelting of certain ores is effected by the heat evolved by the combustion of the sulphur and iron contained in the ores themselves without the aid of coal or other fuel, but simply by means of a current of air forced through on the Bessemer principle. By this process gold, silver, and copper can be obtained at very much less cost and more readily than by the present method, and many poor ores may be profitably employed, which are at present almost valueless. The invention affects the production of metals and the value of mining properties all over the world.

**PREVENTING THE BREAKAGE OF COAL.**—A valuable invention for preventing the breakage of coal in being tipped from pit banks into the screens and wagons has been patented by Messrs. POTTER and HAIR, of the Shiremoor Colliery, Earsdon, Northumberland, and a few days ago was tried at the Maustone Colliery, near Leeds. It is well known to all persons connected with collieries that a large quantity of small coal is made in emptying the corfs as they come from the pit bottom into the wagons, the material in the first instance to pass over the screens. This is more particularly the case with respect to soft and friable coal, so the commercial value is consequently lessened by the ordinary modes of putting into wagons. It is to obviate this serious loss the invention has been introduced, and from the trial made at Maustone the new system is a most advantageous one, as the fall from the screen to the wagon is obviated. Like most inventions of value the *modus operandi* appears to be simple, but most effectual. An iron tray is hung underneath the flat part of the screen by a couple of chains which work over pulleys, having at the other end two weights sufficiently heavy to balance the tray. The balance weights are held down by a lever until the tray is laden with coal, when the lever is raised, and the weights being disengaged the tray descends into the wagon. When the tray has reached the required depth it is tipped by a very simple arrangement, and the coal is then deposited in the wagon without any fall whatever. The tray being then empty the weights bring it back at once to its original position, when it is again loaded, and again goes on its journey. The machine and apparatus are entirely self-acting, excepting that the screens have by altering the position of certain pins to regulate the descent of the tray as the wagon fills, and this can be done without loss of time. The invention is certainly one which is calculated to do good service, and add considerably to the value of the coal by sending it away without slack or small, and so ensuring it in a marketable state. Colliery owners we feel sure will only be too glad to have such a machine at their pit banks; for a trifling cost they cannot fail to be large gainers.



## GOVERNMENT INSPECTION OF MINES.

## THE INSPECTORS' REPORT.

The opinion so frequently expressed that when the men are idle, whether from strikes or other causes, the number of deaths in collieries is much larger than in those years when they keep steadily at work has been again confirmed by the return for 1878 just issued. In 1877 there were 494,336 colliers employed, and they raised 134,179,938 tons of coal, 1,813,541 tons of fire-clay, 12,014,356 tons of ironstone, and 838,395 tons of shale—together, 148,846,260 tons, yet but 1208 lives were lost; whilst in 1878 there were about 20,000 fewer workpeople, and they raised more than 3,000,000 tons less mineral, yet the deaths were 1413, or 17 per cent. more than in the preceding year. During 1878 there were 475,329 persons employed, and they raised 132,612,063 tons of coal, 1,625,586 tons of fire-clay, 10,747,227 tons of ironstone, and 813,262 tons of shale—together, 145,798,138 tons. It will be observed that the output of coal has decreased by 1,567,905 tons. During the year now reported on only 103,183 tons of mineral were raised for each life lost, whilst in the preceding year 123,217 tons were obtained for each life lost, and in 1876 no less than 159,638 tons. There was 1 death in every 336 persons employed in 1878; whilst the numbers were 1 in 409, and 1 in 551 in 1877 and 1876 respectively. This is the more remarkable as the number of collieries in operation was only 3963 in 1878, against 4231 and 4385 in 1877 and 1876 respectively. We subjoin our usual tabulated summary, which will permit of the several classes of accidents being compared:—

## COAL MINES—1877.

Names of districts.	Separate accidents.					Deaths resulting.				
	Explosions of fire-damp.	Falls of coal, sides and roof.	In shaft.	Miscel., in mine and at surface.	Total.	Explosions of fire-damp.	Falls of coal, sides and roof.	In shaft.	Miscel., in mine and at surface.	Total.
Northumberland, Cumberland, & North Durham	1	31	3	29	64	1	32	3	30	68
South Durham & Westmoreland	1	38	12	45	95	1	37	12	45	95
Cleveland, ironstone	1	10	10	21	1	10	10	21	1	21
North and East Lancashire	9	20	7	20	56	42	21	9	20	92
Ireland	1	1	1	1	1	1	1	1	1	1
West Lancashire and North Wales	3	44	14	23	84	40	47	17	23	127
Yorkshire	2	55	15	33	98	3	56	19	26	104
Ditto, coal field ironstone	1	2	1	1	2	1	3	1	1	3
Ditto, Lincolnshire ironstone	1	1	1	1	1	1	1	1	1	1
Derby, Notts, Leicester, Warwick	1	29	6	15	51	1	30	6	21	58
Ditto, ironstone and fire clay	1	1	1	1	1	1	1	1	1	1
North Staff., Cheshire, Salop	3	16	9	13	41	3	16	9	13	41
Ditto, ironstone	1	3	1	1	4	1	3	1	1	4
South Staff. and Worcestershire	6	44	8	12	70	11	47	10	12	80
Ditto, ironstone and fire clay	1	1	1	1	1	1	1	1	1	1
Monmouth, Gloucester, Somerset, and Devon	2	28	4	17	51	2	29	4	18	53
Ditto, ironstone	1	2	1	1	2	1	2	1	2	2
South Wales	6	53	16	26	101	23	55	16	30	122
Ditto, ironstone	1	1	1	1	1	1	1	1	1	1
East Scotland	6	25	14	14	59	212	27	15	17	271
Ditto, ironstone and shale	1	7	1	3	11	1	8	1	3	12
West Scotland	2	25	4	9	40	2	26	4	10	42
Ditto, ironstone and shale	2	1	4	7	13	3	1	4	7	14
Total coal mines	42	408	112	249	811	341	422	124	265	1150
East Scotland	3	24	5	21	53	4	26	5	21	56
Gross total	45	432	117	270	864	345	448	129	286	1206

## COAL MINES—1878.

Northumberland, Cumberland, & Durham	1	31	3	14	49	1	32	4	14	51
North Durham	1	38	7	32	78	4	37	7	35	83
South Durham & Westmoreland.	1	7	10	10	17	1	7	10	10	17
Cleveland, ironstone	9	20	4	15	54	45	33	4	17	99
North and East Lancashire	3	32	4	15	54	45	33	4	17	99
Ireland	2	—	—	2	—	2	—	—	2	—
West Lancashire and North Wales	5	52	8	37	102	204	54	9	37	304
Yorkshire	4	38	4	30	76	4	39	5	22	80
Ditto, coal field ironstone	—	1	—	—	1	—	1	—	—	1
Ditto, Lincolnshire ironstone	—	—	—	—	—	—	—	—	—	—
Derby, Notts, Leicester, Warwick	—	29	7	18	49	—	31	11	13	55
Ditto, ironstone	—	—	—	—	—	—	—	—	—	—
North Staff., Cheshire, Salop.	3	21	9	3	36	28	21	10	3	62
Ditto, ironstone	10	2	—	12	10	10	3	—	3	13
South Staff. and Worcestershire	1	30	7	6	44	1	31	7	8	47
Ditto, ironstone	—	1	2	—	3	—	1	2	—	3
Monmouth, Gloucester, Somerset, and Devon	1	44	4	16	65	268	45	4	16	303
Ditto, ironstone	—	—	—	—	—	—	—	—	—	—
South Wales	5	60	18	28	111	7	62	21	33	123
Ditto, ironstone	1	32	12	13	58	—	33	17	13	65
East Scotland	—	3	1	1	5	2	3	1	2	6
Ditto, ironstone and shale	4	29	5	1	45	22	25	5	12	64
West Scotland	—	2	1	2	5	—	2	1	2	5
Ditto, ironstone and shale	—	2	1	2	5	—	2	1	2	5
Total coal and fire-clay mines.	31	439	88	217	775	585	452	104	233	1371
Total ironstone and shale mines	—	17	6	13	38	—	17	7	14	38
Gross total	31	456	94	230	811	585	469	111	247	1409

The number of persons employed during 1878 in and about the mines classed as metalliferous was 51,458, against 57,395 in the preceding year. Of these 34,624 were employed underground, and 20,834 at surface. Of the latter, 96 (74 in Cornwall and Devon) were females under 13 years of age; 981 (799 in Cornwall and Devon) were females above 13; total females, 2818, or about 5½ per cent. No females were employed underground. From the subjoined summary it will be seen that in the aggregate the following quantities of mineral were produced during the two years reported upon:—

MINING PRODUCE.	1877—tons cwt.		1878—tons cwt.	
	1877—tons cwt.	1878—tons cwt.	1877—tons cwt.	1878—tons cwt.
Arsenic (obtained at the mines)	4,110	17	4,454	14
Arsenic pyrites	5,341	5	5,658	2
Barytes	19,611	9	21,715	12
Bauxite	2,763	0	3,496	0
Bluestone	2,411	0	533	0
Brick-earth	331,101	0	264,692	10
Building stone	2,353	2	3,181	14
Cale spar	2,304	0	2,720	10
Cement stone	3,490	9	3,907	0
Chert	65,217	6	54,598	19
Cobalt ore	628	2	532	3
Copper ore	143	7	357	16
Copper pyrites	758	12	—	—
Dross spar	2,080	0	10,485	0
Fire-clay	77	18	81	19
Fluor-spar	439	0	1,071	0
Ganister	111b 11oz 5d 18gr	—	702oz 16d 8gr	—
Gold ore	2 tons 10c 8gr 8lb.	—	2 qrs 16½ lbs	—
Gold sulphurets	73,948	0	74,908	0
Gypsum	2,815,818	14	2,569,333	19
Iron ore	17,794	18	14,759	18
Iron pyrites	—	—	—	—
Jet	—	—	—	—
Lead ore (dressed)	76,471	1	74,771	2
Lead ore (undressed)	3,638	0	1,610	0
Limestone	828,010	0	478,775	0
Manganese ore	3,088	14	1,734	4
Oshre and amber	2,897	7	2,903	5
Phosphate of lime	41,819	0	40,281	0
Pipe-clay and potter's clay	13,228	0	14,411	10
Porcelain stone for paving, kerbs, &c.	—	—	—	—
Rock salt (exclusive of the white salt made from brine)	207,942	0	182,930	0
Silver	142	10	183 ozs.	—
Silver ore	173,130	10	169,041	1
Silver pyrites	8	0	—	—
State and slabs dressed	68	0	57	0
State undressed	100	0	60	0
Stearite	12,965	0	13,632	10
Tamping stone	1,022	13	950	9
Tin ore dressed (black tin)	11,511	0	9,847	17
Tin ore undressed (white), estimated to contain 97½ tons of black tin	0	2	0	8
Uranium ore	18,304	1	17,871	0
Whinstone	16	0	10	0
Woolfenn	24,327	19	24,593	12
Zinc ore	—	—	—	—

The fatal accidents at the mines, classed under the Metalliferous

Mines Regulation Act, in Great Britain and Ireland amounted to 74, against 87 in the preceding year, the calamities thus being 15 per cent. less numerous than last year. From these accidents the number of deaths resulting was 77, being 20 less than in the preceding year. It appears that in 1878, in the mines classed under the Metalliferous Mines Regulation Act, there was one fatal accident amongst every 811 persons employed in and about the mines, and one death by accident amongst every 1413 persons employed; and in 1877 one fatal accident amongst every 659 persons, and one death by accident amongst every 592 persons employed in and about the mines. The subjoined summary will facilitate the comparisons:—

## METALLIFEROUS MINES—1877.

Names of districts.	Separate accidents.					Deaths resulting.				
	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Total.	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Total.
Northumberland, Cumberland..	10	3	4	2	19	10	4	2	2	21
Durh., Westm., and No. Yorks.	1	—	2	1	4	1	—	2	1	4
East and West Yorkshire .....	1	2	1	—	4	1	2	1	—	4
Derbyshire and Nottingham .....	—	1	—	—	1	—	1	—	—	1
North Wales, Isle of Man, &c. ...	6	2	8	5	21	7	2	9	5	23
South Staffordshire & Worcester.	1	—	1	—	1	1	—	—	—	1
Glouc., Monm., Somerset, &c. ...	4	2	1	—	7	5	2	1	—	8
Glam., Pembroke, &c. ....	—	—	—	1	1	—	—	—	1	1
Cornwall, Devon, &c. ....	10	8	6	2	26	13	9	6	2	30
East Scotland .....	2	—	—	—	2	2	1	—	—	3
Ireland .....	1	—	—	—	1	1	—	—	—	1
Total .....	36	18	22	11	87	41	21	24	11	97

## METALLIFEROUS MINES—1878.

Northumberland, Cumberland...	7	10	4	1	22	7	10	4	1	22
Durh., Westm., & No. Yorks. ...	4	—	1	—	5	4	—	1	—	5
East & W. Riding Yorkshire ...	1	1	—	—	2	1	1	—	—	2
Cheshire, Lancashire, and Sussex	—	—	1	—	1	—	—	1	—	—
Lancashire West .....	—	—	—	—	1	—	—	—	—	—
North Wales, Isle of Man, &c. ....	1	1	8	2	12	1	1	9	2	13
South Staffordshire & Worcester.	—	1	—	—	1	—	1	—	—	1
Glouc., Monm., Somerset, &c. ....	1	1	1	—	3	1	2	1	—	4
Glamorg., Pemb., & Carmarthen	1	—	—	—	1	1	—	—	—	—
Cornwall, Devon, &c. ....	7	4	5	5	21	7	4	6	5	22
East Scotland .....	2	1	—	—	3	2	1	—	—	3
Ireland .....	2	—	—	—	2	2	—	—	—	2
Total .....	27	18	21	8	74	27	19	23	8	77

The subjoined tables show, amongst other things, that there has been a diminution in the output of coal to the extent of 1,567,905 tons, representing about  $\frac{1}{4}$  per cent. upon the entire annual production. The number of collieries in operation have fallen off from 4231 to 3968, or to the extent of nearly  $\frac{1}{6}$  per cent. These tables also show the relative safety of the several districts, and it will again be seen that in those most celebrated for good management and strict discipline the casualties have been fewest:—

The subjoined tables show, amongst other things, that there has been a diminution in the output of coal to the extent of 1,567,905 tons, representing about 1½ per cent. upon the entire annual production. The number of collieries in operation have fallen off from 4231 to 3963, or to the extent of nearly 6½ per cent. These tables also show the relative safety of the several districts, and it will again be seen that in those most celebrated for good management and strict discipline the casualties have been fewest:—

Names of districts.	As computed by each Inspector for his own district.		Per separate fatal accident.	Tons of mineral raised per fatal accident.	Tons of mineral raised per life lost.	Number of miles.
	Males employed.	Tons mineral raised.				
Northumberland, Cumberland, & Durham, & N. Durham	48,019	13,316,156	750	213,801	206,897	212
Do, ironstone & N. Durham	—	3,940	—	—	—	—
So. Durham, Westm., & N. Riding of Yorks.	56,445	10,548,343	595	208,044	208,044	210
Yorkshire—Cleveland	8,569	6,075	408	209,696	209,696	46
North & East Lancashire.	29,344	8,741,387	524	168,056	168,056	34
Do, ironstone	—	135	—	—	—	—
Ireland	1,248	140,181	1248	142,221	142,221	38
W. Lancashire & N. Wales	40,342	11,426,745	480	137,165	90,723	301
Do, ironstone	—	2,811	—	—	—	—
Yorkshire	60,594	15,805,235	606	162,478	151,819	533
Do, ironstone	—	249,454	—	—	—	—
Do, Lincolnshire ironstone	183	122,991	—	—	—	10
Derby, Notts, Leicester, & Warwick	50,285	12,903,866	986	206,305	225,372	412
Do, ironstone	—	103,551	—	—	—	—
North Staff., Cheshire, & Shropshire	26,126	5,742,020	580	157,206	157,206	248
Ditto, ironstone	—	2,183,030	—	—	—	—
St. Stafford & Worcester.	26,780	9,500,000	411	359	141,195	476
Do, ironstone	—	206,452	—	—	—	—
Monmouth, Somerset, & part Glam. & Brecon.	31,906	7,056,136	602	136,792	131,818	394
Do, ironstone	—	95,442	—	—	—	—
South Wales	44,812	11,671,730	443	367	117,714	312
Ditto, ironstone	—	119,423	—	—	—	—
East Scotland	39,769	11,452,372	568	140	166,882	351
Do, ironstone	—	591,222	—	—	—	—
West Scotland	27,934	6,867,701	528	500	168,131	344
Do, ironstone	—	1,723,161	—	—	—	—
Totals and averages	494,386	143,164,344	572	400	172,276	123,217

\* The total quantity of ironstone from the different districts was 12,014,356 tons; which, added to 134,179,938 tons of coal, gives the total of 146,194,344 tons.

Names of districts.	1878.		1877.	1878.
	1878.	1877.		
Northumberland, Cumberland, & Durham, & N. Durham	45,394	12,913,851	926	288,810
So. Durham & Westm., & N. Riding of Yorks.	52,908	18,614,076	690	241,553
Yorkshire—Cleveland	6,701	6,339	309	313,392
North & East Lancashire.	29,789	8,633,849	552	161,415
Do, ironstone	—	41	—	88,044
Ireland	1,222	123,051	611	62,930
West Lancashire and N. Wales	39,024	11,651,797	382	115,388
Do, ironstone	—	19,574	—	96,716
Yorkshire	59,777	15,532,243	770	207,739



mark, for there is no doubt that the quarrymen and managers, who in politics are progressive, are eminently conservative of old ways of workings, are very jealous of innovation made by outsiders, and have the most supreme contempt for anything like science applied to their special craft. But it will not do, and I hope my countrymen will be wise in time enough to conserve their trade, even if they pitch all their old prejudices and tools into Carnarvon Bay.

A workman was killed in the Penrhyn Quarries on the Friday after Ascension Thursday. The men had not worked on that Thursday, in accordance with their belief that if they did a fatal accident would occur, but the accident this time came unfortunately on the Friday.

The Government has instituted a series of prosecutions against mine and quarry owners in the Llangollen district for infringements of the Explosives Act. Mr. Parry Jones, of Oswestry, conducted the cases for the Government, and in most cases fines were inflicted. Let us hope it will lead to more care on the part of the defendants.

The lead mines of my district may be generally described at present as in a state of quiet progress and expectancy. Some of them, I fear, have reached the stage of that "hope deferred which maketh the heart sick." I might mention names of mines in Salop, Flint, Denbigh, Carnarvon, and Cardigan which are in this condition, but, like Mr. Micawber, I, with their owners, cling to the hope of "something turning up."

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

June 5.—The amount of business doing at the collieries does not show any increase upon the week, for the demand from the pig and finished ironworks keeps very restricted, and the warmer weather operates to the disadvantage of the house coalowners. The prices of the Earl of Dudley, which rule the market, are still—furnace coal, 8s.; lump, 7s.; and fine slack, 3s. 6d. and 4s. per ton; all West of Dudley, loaded into boats, railways trucks, or carts, at the various wharfs. The pit proprietors express much dissatisfaction that the final answer of the colliers to their masters' proposition that they should work longer hours, show that they are determined to permit of no departure from the existing eight-hours system, which is a source of so much mischief to the coal and iron industries of South Staffordshire and East Worcestershire. The colliers will, however, at certain of the pits have to fight out the question with their masters as individuals, apart from their connection with other owners as a Coalowners Association. Mr. Benjamin Hingley, whose collieries are situated at Old Hill, Netherton, and Dudley, has publicly announced his determination to close his pits unless the men will work nine hours, and his example is almost certain to be followed by other employers. The Sandwell Park colliers are still manifesting their disposition to secure the pound of flesh. The company has offered to allow the men to resume work with the future wages at 11½d. per ton for cutting coal, and 4½d. for slack. The men have met, and require that the price for coal should be increased by ½d. per ton, and that the company shall not carry out their expressed intention of discontinuing the providing of allowance beer. Because the company adhere to their offer, the men have determined to still remain out. The pig-iron trade keeps in much the same condition as recently reported. Stocks at the furnaces are still large, and consumers will not buy forward, as to either all-mine, part mine, or cinder iron. This state of things would not seem to be encouraging to increased production. Nevertheless, two of the blast furnaces belonging to the Darlaston Coal and Iron Company (Limited) have recently been leased to Messrs. Kelly and Izon, who, it is stated, will shortly put them in work again. The steel question continues to excite considerable interest amongst the trade, and the Cleveland discovery is not regarded so generally as might be thought as likely to revolutionise the iron trade.

Serious news for the colliery owners in the Tipton district was communicated at a monthly meeting of the Mines Drainage Commissioners in Wolverhampton on Wednesday afternoon. At that meeting a resolution of the Tipton district committee was confirmed, which provided that all the pumping-engines in that locality should be stopped that night. For some time past certain of the engines have been kept going solely by the voluntary subscriptions of a few colliery proprietors. With a view to getting traders to take up debenture bonds upon the security which the commission offers in order to enable it to tide over its difficulties, a meeting of colliery owners and commissioners shall, the latter body decided, be called for next Wednesday in Wolverhampton.

#### TRADE OF THE TYNE AND WEAR.

June 4.—The General Trade of the district has improved of late, as is evident from the amount of traffic on the North-Eastern main trunk line and branches, and also the shipments of coals, chemicals, iron, and other products of the district on these rivers. All the collieries are well employed, there having been large shipments of gas coal to the Baltic, Mediterranean, and the Continent of Europe. Best gas coal is from 6s. 6s. to 6s. 9s. 1. The shipments of coal from the Tyne Dock last week were 26,000 chaldrons. The Tyne and Wear are well supplied with shipping, and there is a good prospect for the export trade for the next few weeks. Many large sailing vessels have loaded steam and gas coals lately for distant foreign ports. Now that the strike in Durham is fairly ended it may be useful to look at its causes and results. It is evident that the masters required a reduction, and this they have actually got, nearly to the amount originally asked for; they have also got rid of old stocks, so that they really have, on the whole, got some benefit, while the men have lost an enormous sum in the shape of wages. It is true that the trade has been a little deranged by the strike, especially the house coal trade, but this is not likely to be of a permanent character. The Whitsuntide holidays have interfered with the iron and other trades a little this week; the prices of iron are weak, as more furnaces are getting into blast. The largest of the plate mills at Widdon Park Ironworks have been re-started, and there is a larger number of men employed at these works than for some time past. A good sum has lately been expended on the plate mills, and the fact that the works have been kept going during the holidays is regarded as a sign of a revival of trade in that district. The furnaces which were damped down owing to the recent strike are now in full blast.

Iron shipbuilding continues very brisk on these rivers. Messrs. Leslie, and Co., at Habburn, and most others are fully employed. Messrs. Palmer's Shipbuilding and Iron Company are extremely busy in all departments, the rolling mills, engine-works, and shipyard; in the shipyard there are eleven vessels of various sizes on the stocks, and some large screw steamers just completed. Among the steamers in construction are three torpedo boats recently ordered. The utmost activity prevails in all departments here.

Lead mining in the North of England has been extremely dull for some time, and there is little prospect of any improvement. The price of lead has fallen from 18½ per ton to half that sum. The quarterly bargains of the lead miners employed by the London Lead Company have just been let at Middleton in Teesdale. There has been no further reduction in the number of men employed in the Teesdale Works, but at the Weardale Works the company have found it necessary to discharge over 50 pick men and others. A large number of men have emigrated from this district to the Western States.

At the North of England Institute of Mining and Mechanical Engineers meeting, on Saturday, Mr. J. D. Kendall's paper "On the Hematite Deposits of West Cumberland" will be open for discussion, and specimens of the rocks and fossils will be exhibited.

The Iron Market at Middlesbrough on Tuesday was very dull, and altogether the tone was inactive. Little business was done, and the gathering on 'Change was small. There are but few enquiries for pig-iron, and makers finding they cannot maintain their late rates are willing to take 1s. and No. 3 is about 35s.; No. 4 forgo being 34s. Merchants are about 34s. 6s., No. 3. Warrants are seldom bought. Stocks in warehouse stores 80,000 tons. The Scotch requirements have been less for the past week, the deliveries of pig iron from the Tees not being half what they were in the corresponding week of the previous year or in the previous month. About 2000 tons were forwarded. The declining condition of the Scotch

market is the chief cause of the reduced delivery. The Cleveland ironmasters' returns, though expected to show a considerable reduction in stocks for last month will, it is stated, not present such a favourable aspect as some have been given to expect. There has been an extra demand for pig-iron for Germany lately but the shipments will be correspondingly reduced in the course of the summer, especially with the added duty imposed by the German Government. There is a good deal of talk on the subject which has been mooted with regard to the transfer of Messrs. Hopkins, Gilke's and Co.'s works for the purpose of converting them into steel works. As yet, however, any such project has failed to take shape. The Darnley Iron Company are making active preparations for engaging in steel manufacture. In the Tees iron shipbuilding has been dull, but in the Tyne shipbuilders have work which will last the whole of the summer. Further experimental trials are to be made with Wood's wrought-iron sleeper on the London and North Western Railway as has been done on the North-Eastern. Plates are about 5s. 2s. 6d.; bars, 5s., less commission.

PATENT MARINE BOILER AND PATENT STEAM-WINCH. — Mr. Thos. Archer, jun., of the Dunston Engine Works, Dunston-on-Tyne, has patented a marine boiler and steam winch, which promise from the manifest advantages they possess to find considerable favour among the shipping community. The boiler is designed to economise space, to do the work of the vessel with a less thickness of external plates, and, consequently, thus to increase its carrying capacity. The internal arrangement of the boiler is, roughly speaking, of the following description: it is in its outward form that the patent lies. Instead of the usual large cylindrical chamber, Mr. Archer constructs a series of small cylindrical chambers. By this arrangement the inventor claims that with the same heating surface a much less weight of iron is required, while maintaining the same relative strength to resist pressure, and that, therefore, the first cost of manufacture is considerably lessened. A less quantity of contained water, too, is needed when in working order, and this, combined with the diminished weight of material, increases accordingly the carrying power of the vessel. It can be more easily cleaned and repaired than can any boiler of ordinary description. Screw-stays are entirely dispensed with, while the heated portions of the boiler are left free to expand. Mr. Archer's patent steam-winch is in operation on a number of vessels. It is a modification of the usual winch, having only one in place of two spindles. By an admirable and simple contrivance the winch can be made to "whirl" out cargo with extraordinary rapidity, or by a slow motion can be caused to lift the anchor or the most ponderous weights. The winch takes up less space, and has fewer working parts to get out of order, and much noise is avoided by reason of the "link motion" being dispensed with.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

June 5.—Swansea is to have a new dock, for it is announced that the tender for the new East Dock has been let. It is to cover 38 acres of ground, and to cost 300,000l. The Great Western, London and North-Western, and Midland Railway Companies have guaranteed to rent wharves when the dock is made. That captains of vessels cannot be too careful as to the ventilation of coal-laden ships has again been exemplified. A Board of Trade enquiry, concluded today at Newport, as to an explosion which occurred on board the *Streonshall*, in the Bay of Biscay. She belonged to Messrs. Turnbull and Sons, of Whitby and Cardiff, and had on board a cargo of coal from the Newport Abercrom Colliery. Experiencing rough weather the ventilators, it seems, were closed, and in consequence gas generated, and thus the explosion occurred. The vessels was much injured, but no loss of life occurred. The captain, who is highly esteemed by the owners, was merely reprimanded. The inquiry on the Dinas Colliery explosion was resumed on Wednesday. Mr. Reece, the Coroner, was assisted by Mr. Wheelhouse, Q.C., M.P., who represented the Home Office. The owner of the colliery (Col. Hunt) was represented by Mr. Simons. Mr. T. E. Wales, Her Majesty's Inspector, gave important evidence. He attacked the directors of the colliery in the indictment of the colliery known as Morris's heading or cross-draft. In his report and on other occasions he had condemned the use of pipes for purposes of ventilation, and he trusted that this catastrophe would prove to be the death blow of such a retrograde system of mining. He added—"I cannot conclude my report without expressing my deep regret that John Chubb, who only two months before the explosion had been found guilty of incompetence and gross negligence in the management of this colliery, and his certificate suspended for six months from Nov. 19, should have been appointed ostensibly to act as overman, but from the evidence adduced really acted as manager, thus practically ignoring the judgment of the Court appointed by the Right Hon. the Home Secretary, under the 32nd section of the Coal Mines Regulation Act, 1872." The jury returned the following verdict:—"We find that the death of John Griffiths and William Jenkins occurred through an explosion of gas at the Dinas Pit on Jan. 13, 1879, and that the explosion was accidental, and we believe, on the evidence adduced, that it occurred through a sudden outburst of gas in or near Morris's heading. At the same time we strongly censure the course adopted by the colliery authorities in placing John Chubb nominally as overman, but practically as part manager, after his certificate had been suspended through incompetency in conducting the management of the said colliery."

To turn to the staple trades of the district, the Whitsuntide holidays have naturally had some effect in decreasing operations, but not to any great extent. The men are anxious to get work when they can; they have sufficient enforced idleness as it is. About the average amount of work appears to be doing at the local iron-making establishments, but during the past few days clearances have been almost nil. The demand for railway is nothing new to speak of, and bars are not so brisk by any means as one could wish to see. The demand for steel rails is fairly good, but complaints as to prices are very numerous. Things look a little brighter in the Tin-Plate Trade. The Kidwell Works for one thing have been re-started. A meeting of the coke and tin-plate masters has been held at Swansea, when it was resolved to continue the restriction of make by only working four days a week for another six months, also that plates should not be sold under 16s. per box for I.C. Thirty more mills have joined the association. There can be but little fresh noted with regard to the coal industry. For obvious reasons shipments have to some extent fallen off. There is fair enquiry for steam coals, but orders for house coal are scarcer. No change can be noted in prices. Matters between employers and their men stand about the same as reported last week.

Notices to terminate contracts have been posted at many of the collieries by the employers, but in the Ogmore Valley a section of the men have given a month's notice to have the 10 per cent. reduction they accepted returned. The Tredegar colliers to considerable numbers turned out on strike. The matter has, however, been now amicably arranged, and the men have returned to their employment. More meetings of colliers have been held since last report. At one, held at Mountain Ash, Mr. Thos. Halliday, the well known Unionist leader, addressed the men, and argued strongly against the Barneley proposal to stop work at all collieries in the county for six weeks. Many of his supporters probably will not like this, but only a little while ago the Blaenavon men—I think it was—turned on him because he advised them for their good. At a meeting held near Pontypool the men pronounced in favour of the proposal. At Bonville's Court Pit, Saundersfoot, the Kilgetty vein of coal has been reached.

#### FOREIGN MINING AND METALLURGY.

No very striking fact has occurred during the last few days to vary the monotony of the Belgian iron trade. Preparations are beginning to be talked of and made for the Belgian National Exhibition to be held at Brussels in 1880. The Belgian Minister of Public Works has decided on the establishment of a Bureau of Commercial Information; this new office will direct its attention more particularly to transport questions. The information rendered available by the new office will be given gratuitously to applicants. M. Petry-Chaudoir, of Liège, is now forwarding to Holland 25 bridges (of which two are swing-bridges) for the Zwob and Almelo Railway. The importance of this contract is rather more than 300 tons. The deliveries of coal have been fairly active in Belgium if we take account of the period of the year and the depression under which metallurgical industry, that great consumer of coal, is at present languishing. The sugar-works have been laying in supplies for next season. Freight for France has slightly declined. There do not appear to be any very clearly defined quotations for coal in Belgium at present; coalowners have, indeed, been selling at extraordinarily low rates. The Crachet Picquary Collieries Company produced 145,800 tons of coal last year, as compared with 131,050 tons in 1877, showing an augmentation of 15,750 tons last year. The results of the past year's working were not favourable; nevertheless, 2400l. was paid away in dividends last year. The production of the Belgium Collieries Company declined last year to the extent of 8 per cent.; the sales effected declined in a still greater ratio, and the year's operations resulted in a loss of 9349l.

Some of the mechanical construction establishments of Milan have received, or have been executing, some fair orders of late. Miani, Venturi, and Co., have just completed a bridge over the Fella, on the Ponteborra line. Messrs. Cerimedo and Co. have also secured a contract for the works of an iron bridge on the Adige. The Silesian Zinc Mines and Works Company extracted 385,321 tons of coal last year from its collieries. This total was somewhat below the corresponding extraction of former years, the falling off being attributable to a suspension of extraction operations at the Jacob Schacht Mine. The sale of the coal not utilised at the company's ironworks last year was a matter of some difficulty, notwithstanding the extremely low rates current. The preparatory works carried out last year at the companies' collieries involved an outlay of 17,098l.

The Northern of Spain Railway Company has just let some rather important contracts, having given out orders for 27 locomotives with tenders. These orders have been shared between three works. The locomotives are of the eight-wheeled coupled type, and they are

to be delivered at Santander at 47l. 12s. per ton, or on the rails at Iron at 48l. 8s. per ton. The tenders are to be delivered at 31l. 4s. per ton. The Royal Asturian Mines Company has a balance of 45,785l. available for dividend for 1878. This balance admitted of the payment of a dividend of 2l. per share for the past year. The reserve fund has now reached such a large amount (179,016l.) that the council of administration does not deem it necessary that any further addition should be made to it.

Business in iron has been pretty well sustained in the Haute-Marne, and prices have hardened rather than otherwise. A scale of 8s. per ton per class has been re-established for rolled iron. Coke-made iron has been well maintained at 6l. 8s. to 6l. 12s. per ton. There has not been much demand for machine iron, but iron-wire has been in pretty good demand; pig for second fusion has been in fair request; No. 3 is quoted at 3l. to 3l. 1s. 6d. per ton, according to the importance of the transactions effected. In the Nord orders have come to hand pretty freely, and the works have employment assured to them for several months to come.

#### SULPHURIC ACID AND ALKALI.

Although, perhaps, less is heard by the general public of the manufacture of sulphuric acid and alkali than of many other industries there is scarcely a trade which could be carried on were the supply of those materials stopped. Among all branches of chemical industry, says Prof. GEORGE LUNGE,\* of technical operations connected with alkali making, is pre-eminent, not merely from the magnitude of the works, the absolute bulk of the raw materials used and the quantity produced, but also from the fact that most other chemical products require one or more branches of alkali making as the conditions of their own existence. The Professor uses the expression "alkali making" in its widest sense, embracing the manufacture of sulphuric acid, sulphate of soda, muriatic acid, soda ash, &c., and bleaching powder, and including, also, those works which stop—for instance, at sulphate of soda, or even at sulphuric acid itself—since most factories making these as intermediate products are also sellers of them, and no strict separation can be made in this respect. In this wider meaning the products of alkali making are necessary materials for many metallurgical processes for the manufacture of artificial manures, soap, fatty and mineral oils, glass, paper, many inorganic and organic colouring matters (especially nearly all coal tar dyes), and even of many articles of food. It is thus evident how great is the importance of the alkali trade in its wider meaning to the civilisation of mankind, though it is certainly going too far to measure, as some have done, the civilisation of a country by the development of this special industry.

The different branches of alkali making are organically connected in such a manner that only under special local conditions can one or more of the principal subjects be omitted. The initial process is, Prof. Lunge explains, nearly always the manufacture of sulphuric acid, by burning brimstone or pyrites with the aid of nitrate of soda and of fuel, and in many cases leaving a residue from which copper iron oxide and even silver are obtained. The sulphuric acid then enters largest into manufactures not belonging to this cycle, of which only that of superphosphate is, as a rule, conducted on a sufficiently large scale to admit of the establishment of works for it exclusively. With this one very large and a few small exceptions the manufacture of sulphuric acid is at once followed in the works by a second step—the manufacture of sulphate of soda by decomposing common salt with sulphuric acid, muriatic acid appearing as a by-product. Both articles are again required in several other chemical industries, and are accordingly sold as they are, but for the most part they only serve as intermediaries, the sulphate being further worked up to soda ash, and the muriatic acid to bleaching powder, more rarely to chlorate of potash at the same works. Some works sell their sulphate of soda as such, either for the manufacture of glass, &c., or to alkali works. Especially is this the case in countries where fuel is too dear for making alkali with a profit. The calcined sulphate of soda or salt cake is a solid body, easily carried, not merely in ordinary casks, but loose in whole truck or ship loads. On the other hand, the muriatic acid which appears as an unavoidable by-product is in the same predicament as vitriol—that is to say, the expense of package and carriage forbids its sale in large quantities and conveyance to great distances. Very frequently (though certainly much more rarely now than formerly) the muriatic acid, liquefied solely for the sake of not laying waste the vegetation of the country around, was run into the nearest water course, whose water was anything but improved by it. It was, therefore, a matter of importance to utilise the muriatic acid in a form in which the difficulties of transit were overcome, and, fortunately, such a form has been found even before the development of the alkali manufacture in bleaching powder. Probably all works not going beyond salt-cake are compelled to utilise their muriatic acid in some way; and they do it mostly by the production of bleaching powder, more rarely by that of chlorate of potash of bicarbonate, or by using up the acid itself.

The position and experience of the author gives him unusual facilities for treating the subject, and it cannot be doubted that he has utilised those facilities to the utmost. In the first place, he describes the processes and products scientifically; this is followed by technical and theoretical descriptions of all the processes occurring in this series of manufactures; and his third and principal object has been to give to practical manufacturers both complete and reliable information upon all the apparatus and processes which have come under his notice, so as to enable them to know what has been done in this field beyond the range of their own personal observation. His own practice of eleven years in the North of England has been supplemented by numerous visits to the other alkali manufacturing districts of Britain, and to those of Belgium, France, Germany, and Austria. Mr. Lunge's present position as professor at a technical high school enables him to state frankly what he knows and what he has seen, since he can expect no benefit whatever from keeping anything back. In his visits he has, of course, been favoured with some confidential communications which he is not at liberty to reproduce here as he received them; but in every case he has obtained permission to make use of the substance of such communications for this treatise, and in the vast majority of cases no restraint whatever has been placed upon him. He has thus been enabled to embody a large number of facts partly published abroad, partly never previously published, and all of them comparatively or entirely unknown in this country; but this has not been done to the exclusion of the British styles of working and of the inventions made here, which, on the contrary, form the groundwork of the whole treatise, since the author's personal working experience was gained in England. The greatest prominence has been given to the processes now in general use, and he has grouped others around them, appending critical remarks as to their practicability whenever that was possible.

The present volume gives all that is useful to be known with regard to sulphuric acid, the chemical and physical properties of oxides of sulphur being first considered, and this is followed by a chapter on the analysis of sulphuric acid. The history and general principles of acid making are then given, and then comes a chapter on the raw materials of the sulphuric acid manufacture, in which brimstone, pyrites, other sources of sulphur, nitrate of soda, and nitric acid are treated of in different sections. The production of sulphuric acid from brimstone occupies the fifth chapter, and there is then a chapter on the production of sulphuric acid from pyrites. In this chapter Prof. Lunge refers to the new crushing-mill invented by Motte, of Dampreny, near Charleroi, which has been improved by the Markisch Engine-works. The principle is that of a peculiar kind of mortar, with hollow bottom, in which the crushing is done by a pestle. He remarks that whether this mill is really preferable to the stone-breaking machines (Blake's) experience will show. For crushing purposes generally most will be inclined to give the preference to the original; but the new mill has at least one advantage

\* "A Theoretical and Practical Treatise on the Manufacture of Sulphuric Acid and Alkali, with the Collateral Branches." By GEORGE LUNGE, Ph.D., F.C.S., formerly Professor of Technical Chemistry at the Federal Polytechnic School, Zurich (formerly Manager of the Tyne Alkali Works, South Shields), Vol. I. London: John Van Nostrand, Paternoster-row.



for certain purposes, which Prof. Lunge does not notice. There is a regular and continuous crushing action in the mortar proper; but from the way in which the bottom of the pestle fits the inverted conical opening in the bottom none of the material can pass from the mortar without undergoing a grinding action, which must result in fine and uniform powder. The advantage of this would in many cases compensate for the diminished economy. In subsequent chapters the burner gas, the lead chambers, working the chambers, recovery of the nitrogen compounds, the theory of the formation of the sulphuric acid in the lead chambers, the purification of sulphuric acid, its concentration, the arrangement of the apparatus of sulphuric acid works, the yields and costs of sulphuric acid manufacture, the by-products of the manufacture of sulphuric acid, the manufacture of fuming oil of vitriol and of sulphuric anhydride, and other processes for manufacturing sulphuric acid are treated of, the concluding chapter giving the applications of sulphuric acid and statistics.

The volume will be of great value to the student of practical chemistry, as it will give him an amount of information not obtainable from any other source, and which, being given by a scientific writer who has had long working experience of the processes he describes, is the best substitute for actual practice which the student can hope for. It will also prove useful to the manufacturer himself, whilst to the general reader it will not be uninteresting.

## THE WEEK.

**SATURDAY, MAY 31.**—Speculative buyers of railways were a good deal exercised in their minds by the prospect of bad Whitsuntide traffic, owing to the dismal weather. Brighton, A., disappointed the hopes of many by falling 1 per cent. A large business was transacted in Bolivian and Mexican. The former, from closing 34, 35, opened at 38, and remained steady at this to the finish. Mexican advanced 3/4, to 10 1/4. Rollers were offered, and relapsed to 15 1/4, 15 3/4.

**WHIT MONDAY.**—Holiday on Stock Exchange.  
**TUESDAY.**—Although business was only resumed in a half-hearted manner several noteworthy changes took place. Mexican bonds were in high favour. On Friday the price was 9 1/2 to-day at one period 13 1/2 was reached. Although Mexico has remained very contentedly a defaulter for 13 years, there crops up periodically a craze that something is going to be done. Just at the close a large amount was "slipped," it is believed, at 12 1/2, causing the quotation price to instantly recede to 12 1/4. No such price has been seen since 1876, when 13 1/2 was reached, followed by a steady reaction down to 5. Great Eastern lost ground very materially; after being 61 in the morning all efforts to check sales seem to have been abandoned, and the closing was dull, at 50 1/2. Brighton, A., receded to 11 1/2; Dover, A., to 11 1/2. **WEDNESDAY.**—Buying of Mexican was resumed at prices between 12 and 12 1/2, but soon the offers made by sellers swamped the buying, and the price declined to 11 1/2. Honduras touched 6, then receded to 4 1/2, 5. One would imagine the buying of this class of security could only arise from those abnormally credulous, Brighton, A., was neglected neglected at 11 1/2, and Dover, A., remained lifeless. Odd enough, Berwick advanced 1 1/2, because the traffic decrease was only 13,405. From the appearance of the market it would not be surprised to see an advance in Egypt Unified and Preference. The former closed at 42 1/2, and the other 62 1/2.

**THURSDAY.**—Again Mexicans rose in the morning, but only to decline in the afternoon. Owing to the flatness of the Bourse at Vienna a marked decline was shown in Austrian Gold, Hungarian Gold, Russian, 1873, and Lombard shares. At one time Egyptian Unified was selling at 43 1/2, and Preference at 63 1/2. Grand Trunk First Preference had a sharp rise to 40 1/2. The Cape Copper dividend is to be 12s. 6d. per share.

**FRIDAY (Opening).**—Business is chiefly centred in foreign bonds. Austrian and Hungarian are something firmer, but Egyptian Unified has fallen to 42 1/2; Mexican, 11 1/2 to 12; Bolivian, 35 1/2 to 36; Erie shares, 28 to 28 1/2; Second Mortgage, 73 1/2 to 74 1/2; Five per Cent., 74 to 74 1/2. One or two mining shares are quoted better, and among them Richmond, 1 1/2 to 1 3/4; and Wheel Creek, 3 1/2 to 3 3/4. Rio Tinto, 4 1/2 to 4 3/4; Fortuna, 3 1/2 to 3 3/4; Gold Run, 6s. to 6s.; Antioquia, 3 1/2 to 3 3/4; Port Phillip, 9s. to 11s. **Two o'clock.**—A decided weakness has come over the foreign market, and again Vienna is credited with the blame. A large, unwinding "bull" account appears to have accumulated there, which can only be set at ease by selling. Austrian Gold are down to 63 1/2, and Hungarian Gold to 63 1/2; Italian, 81 1/2 to 81 3/4; Egyptian Unified, 43 1/2 to 43 3/4; ditto Preference, 62 1/2 to 63. In railways Caledonian has fallen 1/2, and Great Eastern 1/2. A large business is being done in Vienna obligations at prices varying from 8 1/2 to 9 1/2; East Argentine, 7 1/2 to 8 1/2; Lima, 1 1/2 to 2 1/4; Royal Sardinian, 3 to 3 1/4. **Four o'clock.**—Towards the close there was some spirited bidding for Egyptians, sending the price 1/2 up in a few minutes. The Unified are now quoted 43 1/2 to 44, and the Preference, 63 1/2 to 64. Mexican, 11 1/2 to 12; Turks, 11 1/2 to 11 3/4; East Argentine, 7 1/2 to 8 1/2; for Wheel Creek, New Zealand Kapanga, 3 1/2 to 3 3/4; Javali, 6s. to 6s.; Chapel House, 1 1/2 to 1 3/4; Newport Abercorn, 4 to 5; Cardiff and Swansea, 3 1/2 to 4; Mexican Railway, 1 1/2 to 2 1/4.

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at the Thatched House Hotel, New Market place, Manchester, on Wednesday, the 25th day of June, 1879, at Three o'clock in the afternoon, all that valuable COLLIERY situated at Stand Lane, near Radcliffe, in the county of Lancaster, known as the

## STAND LANE COLLIERY.

Together with the

STEAM ENGINES, STAMM BOILERS, RAILWAY SIDINGS, RAILWAY COAL WAGONS, TUBS, RAILS, CHAIRS, SLEEPERS, HORSES, CARRIAGES, GEARS, and all and every other thing, stock, and effects in, upon, or about the mines, shafts, banks, yards, stables, and premises of the Stand Lane Colliery Company (Limited), situated and being at their Stand Lane Pit, Whitefield Pit, and Spring Well Pit, all in the township of Pilkington and county of Lancaster.

The whole of the estate and effects will be offered for sale in One Lot, as a going concern, the Liquidator of the company reserving only the book debts due and owing to the company on the day of the date of the completion of the purchase.

The mines included in lease lie in the two belts respectively known as the Stand Lane and Whitefield Belts.

In the Stand Lane Belt the mines now being gotten are the well-known Three Yards Mine and Two Yards Mine of the Radcliffe district at a depth in the shaft at Stand Lane of 265 yards to the Two Yards Mine, below which the shaft is sunk a distance of 135 yards towards the well-known Doe and Trencherbone Mines, which lie underneath, and have been proved at adjacent collieries.

In the West or Whitefield Belt a new winning has been commenced, and a shaft sunk to a depth of 400 yards to the Two Yards Mine, by which a large area in the Two Yards and all the overlying mines has been won. This shaft is connected by a siding with the East Lancashire section of the Lancashire and Yorkshire Railway.

The MACHINERY comprises at STAND LANE—Horizontal coupled winding engines, 30 in. cylinder 5 ft. stroke, 18 ft. drum, by Garforth, with steam break erected only four years since; pair 14 in. cylinder winding engines; pumping engine, 16 in. cylinder 2 ft. stroke; donkey engine, &c., and four double-flued boilers, two of which have been recently erected; ventilating fan, 12 ft. diameter, 4 ft. wide, and pair of horizontal engines 8 in. cylinder and 12 in. stroke, to work the same.

At WHITEFIELD RAILWAY PIT—Horizontal engine, 16 in. cylinder 3 ft. stroke, drum 4 ft. 6 in.; one pair 14 in. cylinder horizontal engines; donkey engine; two double-flued boilers.

At WHITEFIELD NEW SINKING—Pair of horizontal engines, 16 in. diameter 30 in. stroke, used for sinking, with drums, pulleys, &c.; pair of 36 in. cylinder horizontal engines, the contract price for which is £2500 when erected, now on the ground awaiting erection.

There are 70 8-ton railway wagons, 600 coal tubs, 16 coal carts, 13 horses, 6 ponies, 10,000 yards of iron pit rails, jigs, pulleys, cranes, plates, &c., &c.

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Further particulars may be obtained on application to the Liquidator of the company, ADAM MURRAY, Esq., Accountant; or to Messrs. T. A. and J. GRUNDY and Co., Solicitors, both of No. 104, King-street, Manchester.

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(LIMITED).

NOTICE IS HEREBY GIVEN, that in the Cause of the BRITISH DYNAMITE COMPANY (LIMITED) and NOBEL'S EXPLOSIVES COMPANY (LIMITED), *versus* FRANCIS KREBS and others, that the Right Honourable the House of Lords have, upon the appeal of the plaintiff companies, reversed the decision of the Court of Appeal below, and upheld the judgment of Mr. Justice Fry, given upon the 15th of June, 1877, whereby he awarded to the plaintiff companies an injunction to restrain the defendant, FRANCIS KREBS and others, during such time as certain Letters Patent of the 7th of May, 1867, should remain in force, from Manufacturing or Selling in this country any Lithofractor or any compound consisting of or containing Nitroglycerine absorbed into any porous unexplosive substance.

Notice is hereby further given, that any person infringing such Patent, or in any way Importing, Purchasing, Selling, Dealing in or Using any Lithofractor or any other compound consisting of or containing Nitroglycerine absorbed into any porous unexplosive substance will, immediately upon such fact coming to the knowledge of the plaintiff companies or their agents, be proceeded against, and such relief sought as the said companies may be advised.

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Dated this 8th day of April, 1879.



PARIS, 1875.  
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,  
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At the south end of the St. Gothard Tunnel, where

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Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24-90, 27-60, 24-80, 26-10, 28-30, 27-10, 23-40, 28-70 metres. Total advance of south heading during January was 121-30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere ( $7\frac{1}{2}$  lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

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These Machines possess many advantages, which give them a value unapproached by any other system of Boring Machine.

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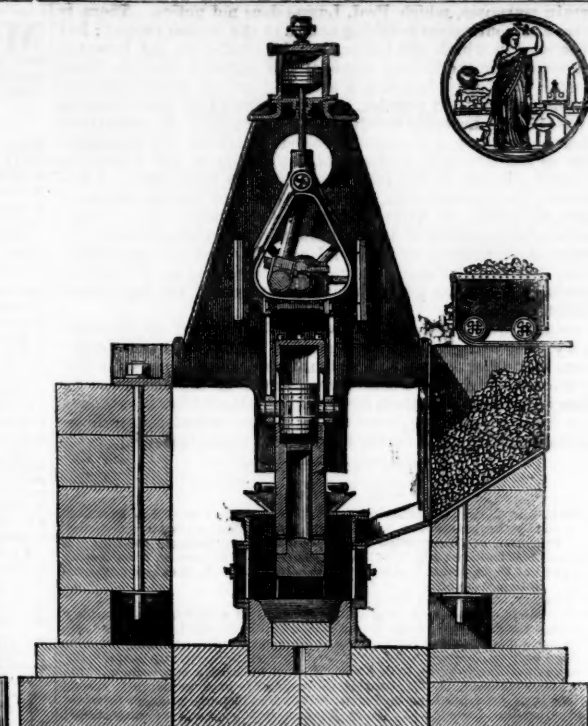
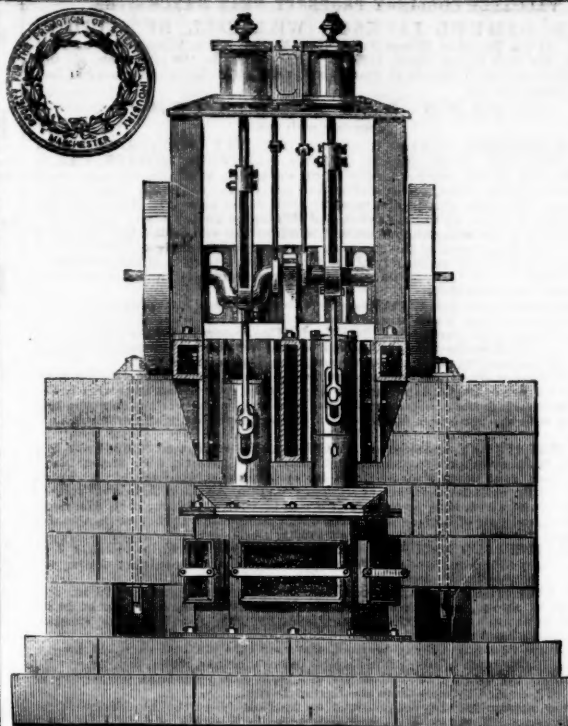
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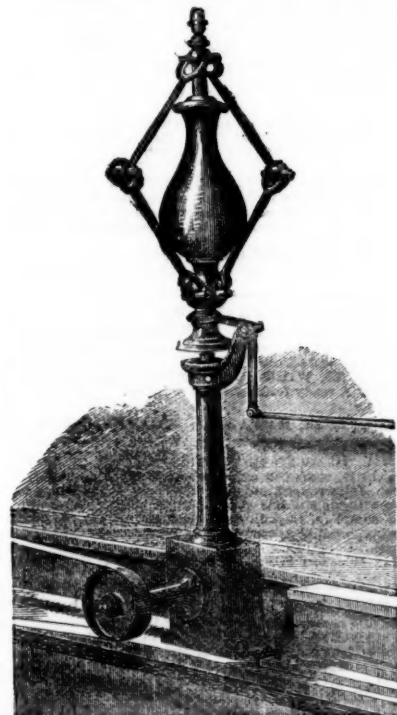
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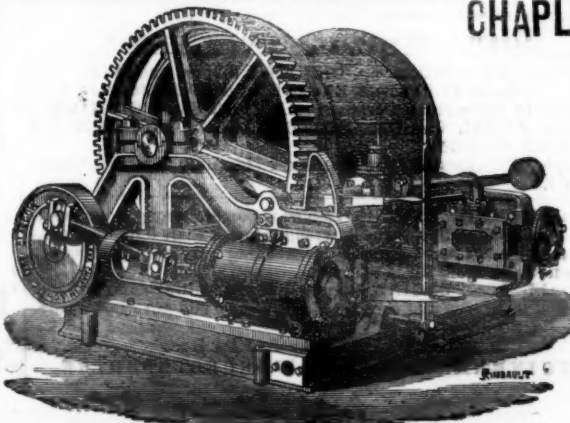
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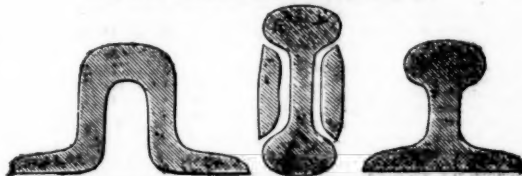
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